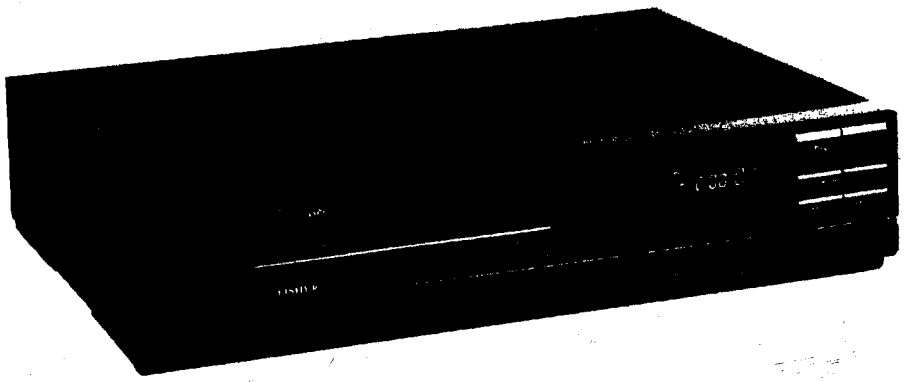
ELECTRICAL & MECHANICAL ADJUSTMENT

FISHER

FVH-P5000/P5100

(U.K.)

VIDEO CASSETTE RECORDER



(Photo: Model FVH-P5100)

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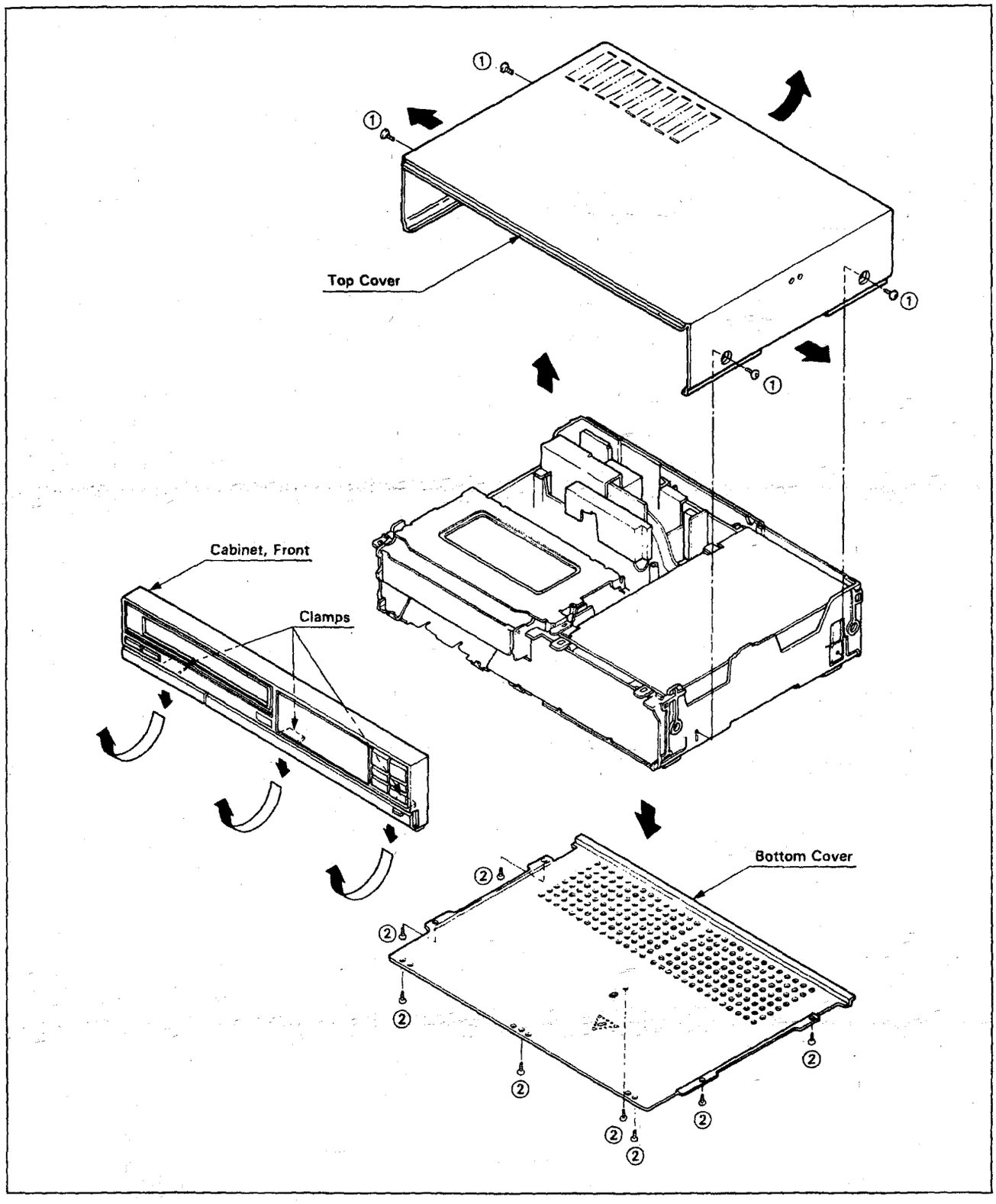
REFERENCE NO. WM-20783

1. CABINET DISASSEMBLY

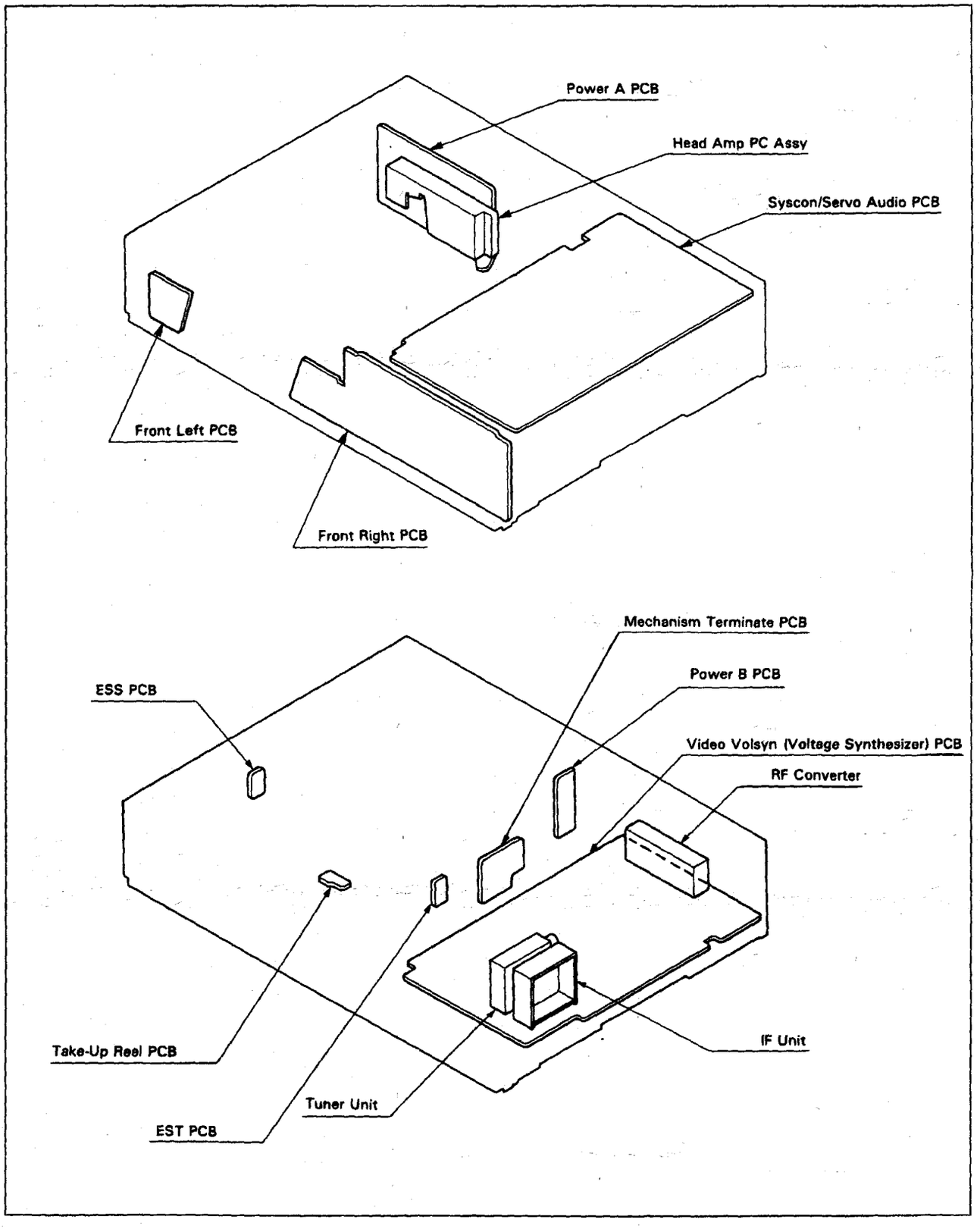
When disassembling the following parts, remove the screws shown in the figure in numerical order, and remove the parts in the direction of the arrows while pulling the clamps.

Note: Do not push or pull the clamps strongly, as damage may occur.



2. CIRCUIT BOARD DISASSEMBLY

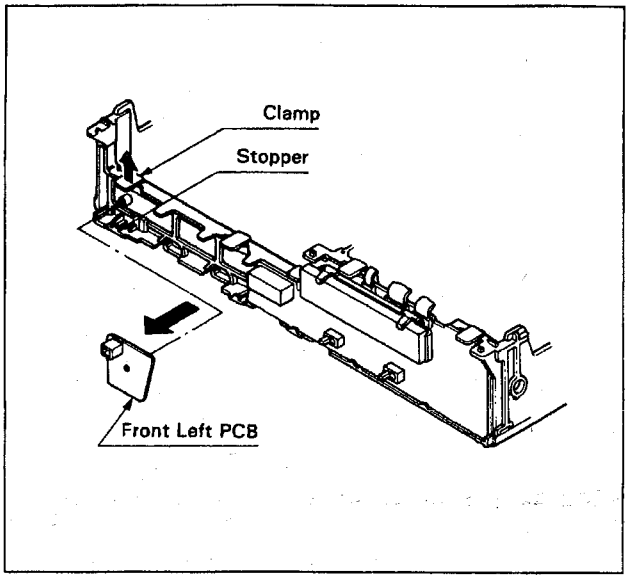
2.1 CIRCUIT BOARD LOCATIONS



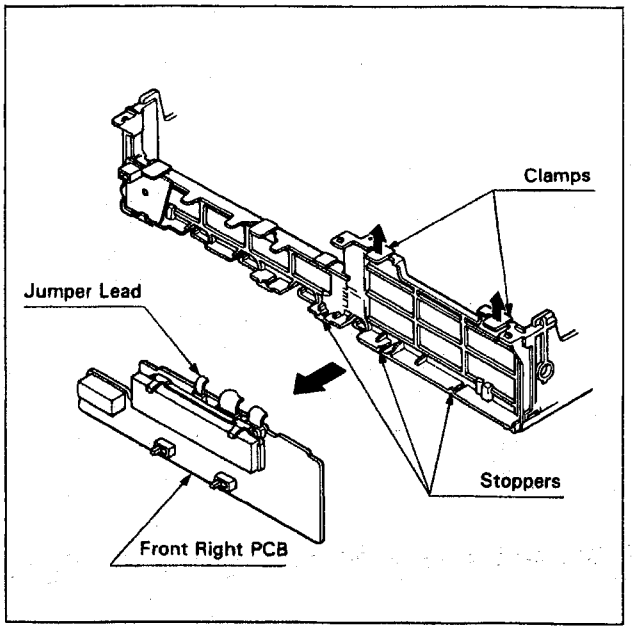
2.2 CIRCUIT BOARD DISASSEMBLY

1. Be sure to disconnect the AC plug before doing the following procedures.
2. When disassembling the circuit board, remove the screws shown in the figure in numerical order, and remove the board in the direction of the large arrow while pulling the clamps in the direction of the small arrows. For complete removal, disconnect the connectors and, if necessary, remove the soldered connections on the connectors or the jumper lead.
   Note: Do not push or pull the clamps strongly, as damage may occur.

2.2.1 FRONT LEFT PCB

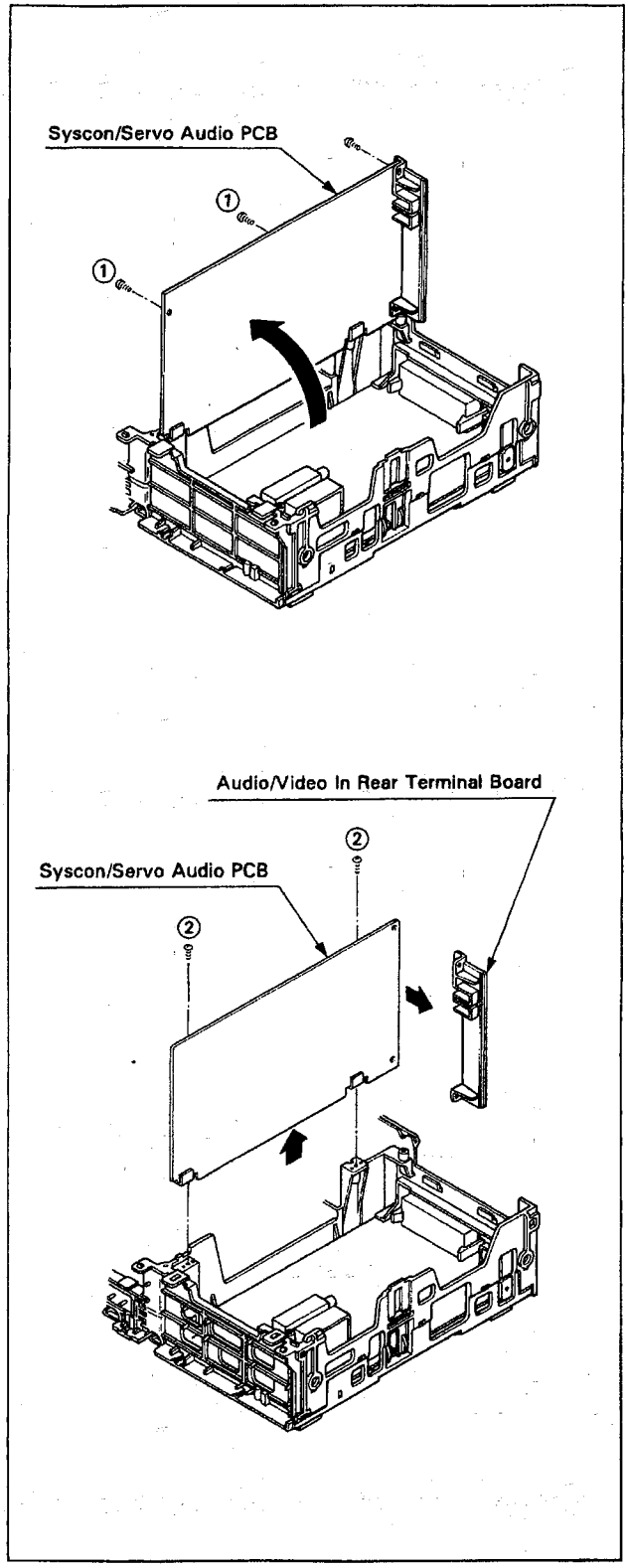


2.2.2 FRONT RIGHT PCB

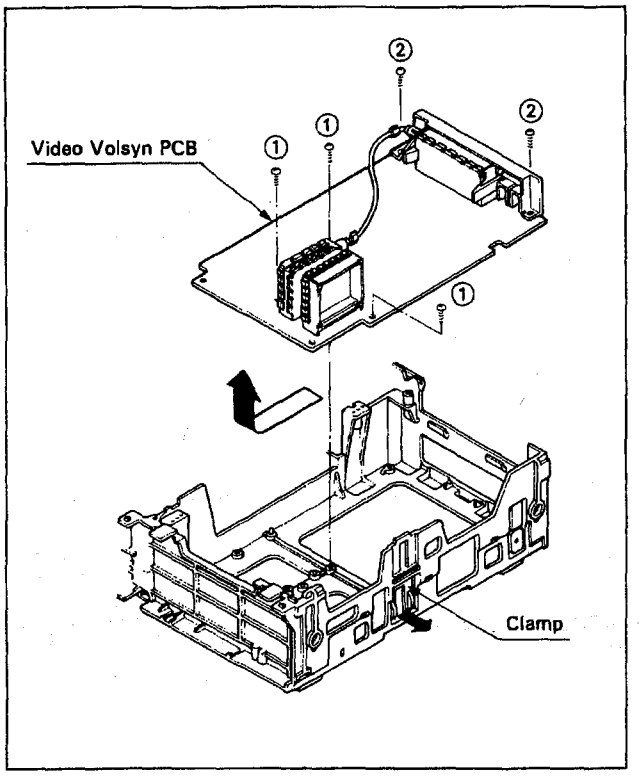


2.2.3 SYSCON/SERVO AUDIO PCB

When removing Audio/Video In Rear Terminal Board, unsolder RCA pin jacks of Audio/Video In Rear Terminal Board from Syscon/Servo Audio PCB.

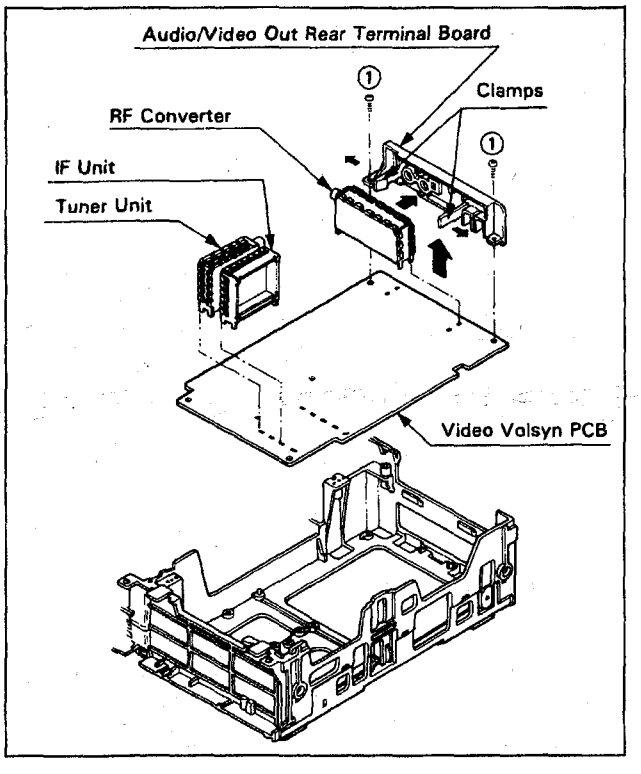


2.2.4 VIDEO VOLSYN (VOLTAGE SYNTHESIZER) PCB

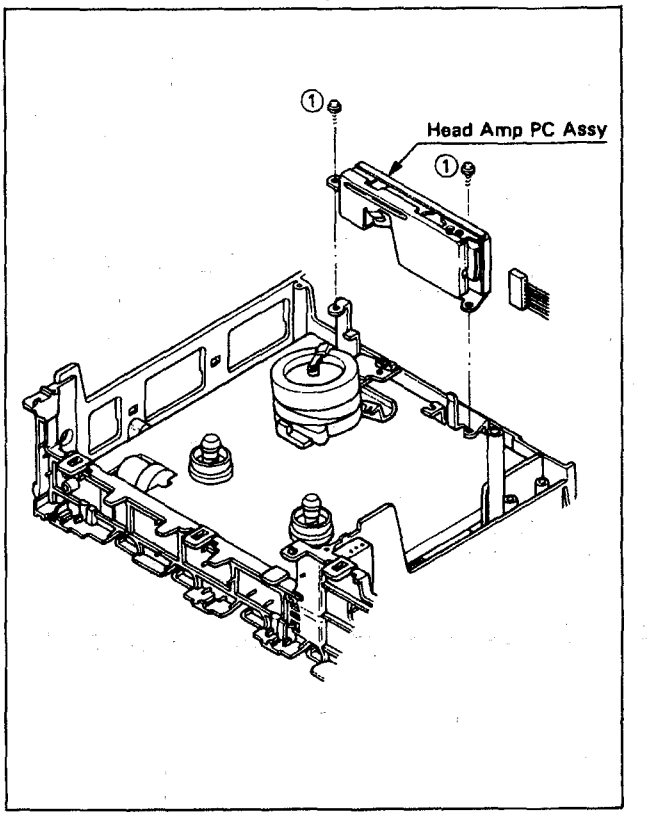


2.2.5 TUNER UNIT, IF UNIT AND RF CONVERTER

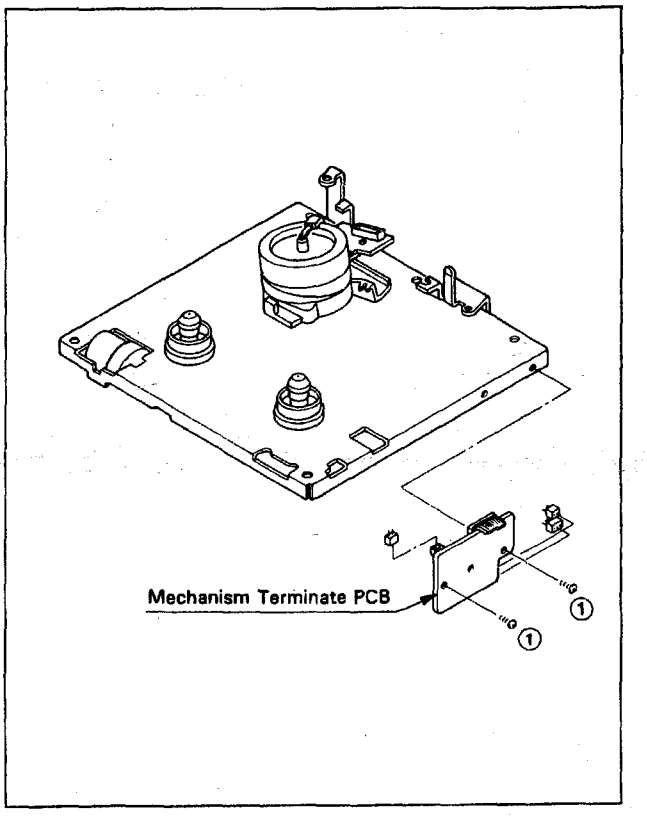
When removing Tuner Unit, IF Unit and RF Converter, unsolder from Video Volsyn PCB.



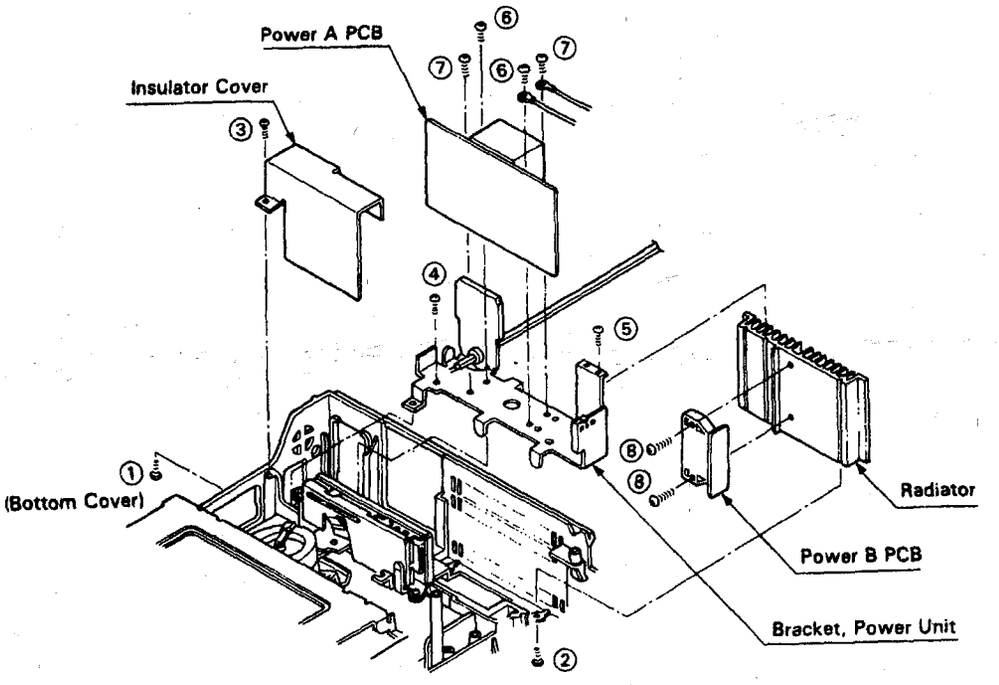
2.2.6 HEAD AMP PC ASSY



2.2.7 MECHANISM TERMINATE PCB



2.2.8 POWER PCB



MEMO

3. ELECTRICAL ADJUSTMENT

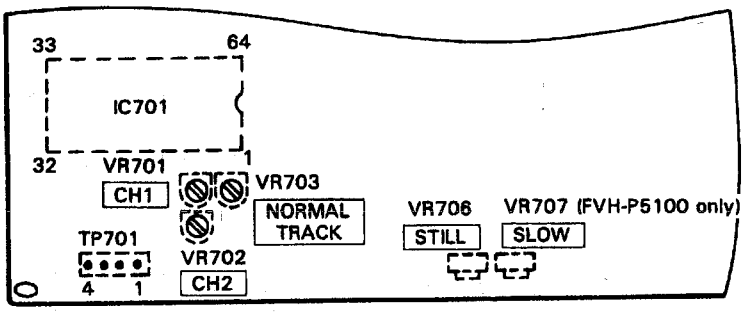
3.1 SYSTEM CONTROL SERVO CIRCUIT

- These adjustments should be carried out upon completion of the tape transport adjustments.
- If the tape transport adjustments (except the tilt adjustment) are carried out after these adjustments, follow the procedures again in Section 3.1.4 (1) CH1 PHASE/CH2 PHASE and (3) X VALUE.

3.1.1 EQUIPMENT AND JIGS REQUIRED

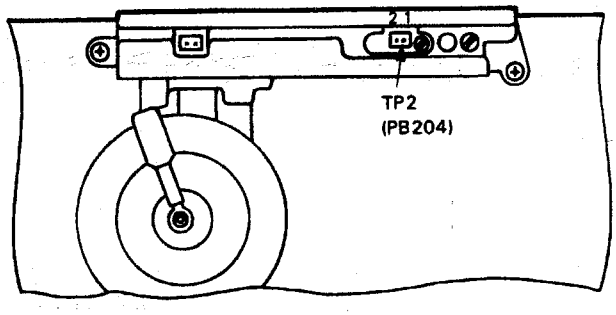
Oscilloscope	Dual trace with an external trigger terminal or more than triple trace.
Monitor TV	
Test Tape	VPM-6 (SVJ-00031): Monoscope, 6 kHz

3.1.2 LOCATION OF ADJUSTMENT POINTS



SYSCON/SERVO AUDIO PCB (FOIL SIDE)

Fig. 3.1.1



HEAD AMP PC ASSY

Fig. 3.1.2

3.1.3 TEST EQUIPMENT CONNECTING DIAGRAMS

For adjustments (1) through (4) in this section, refer to the corresponding paragraphs (number in parentheses) in Section 3.1.4.

(1) CH1 PHASE/CH2 PHASE (PLAY MODE)

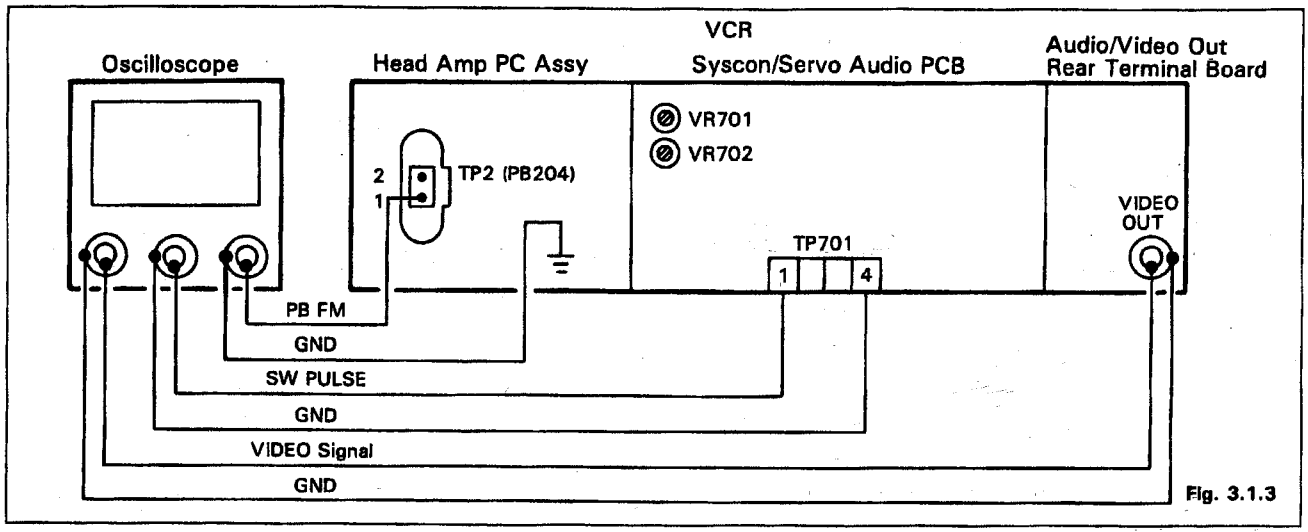


Fig. 3.1.3

(2) PLAY MODE TRACKING

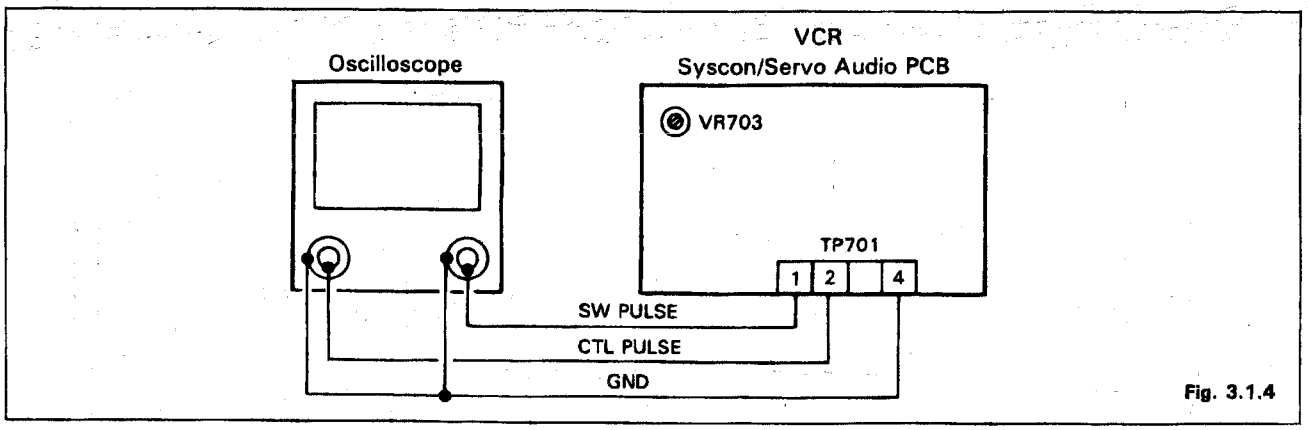


Fig. 3.1.4

(3) X VALUE

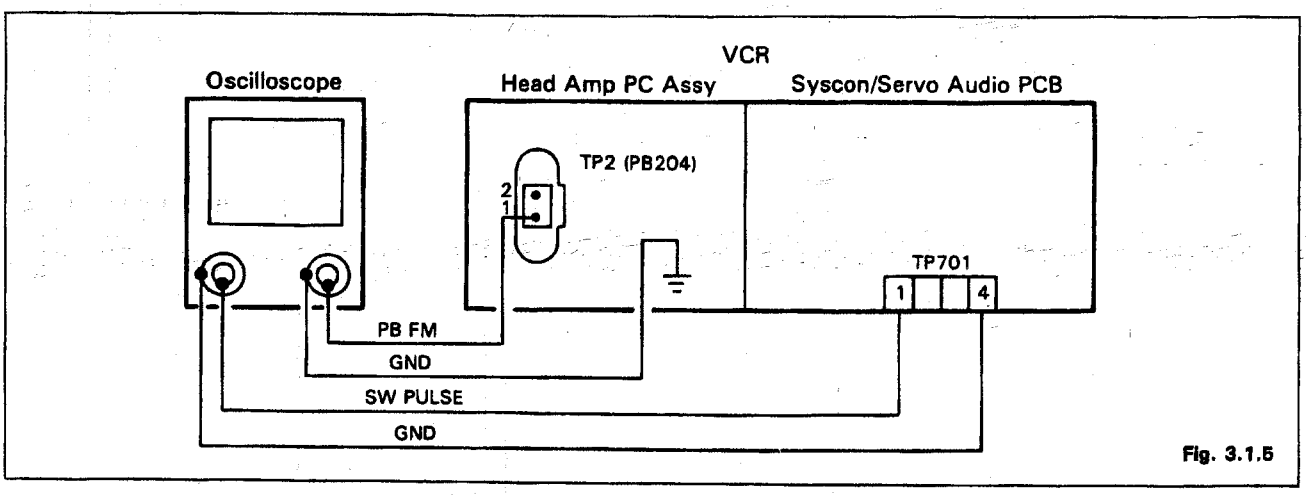


Fig. 3.1.5

(4) V-ADDITIONAL PULSE

[A] ADJUSTMENT BY THE PICTURE OF MONITOR TV

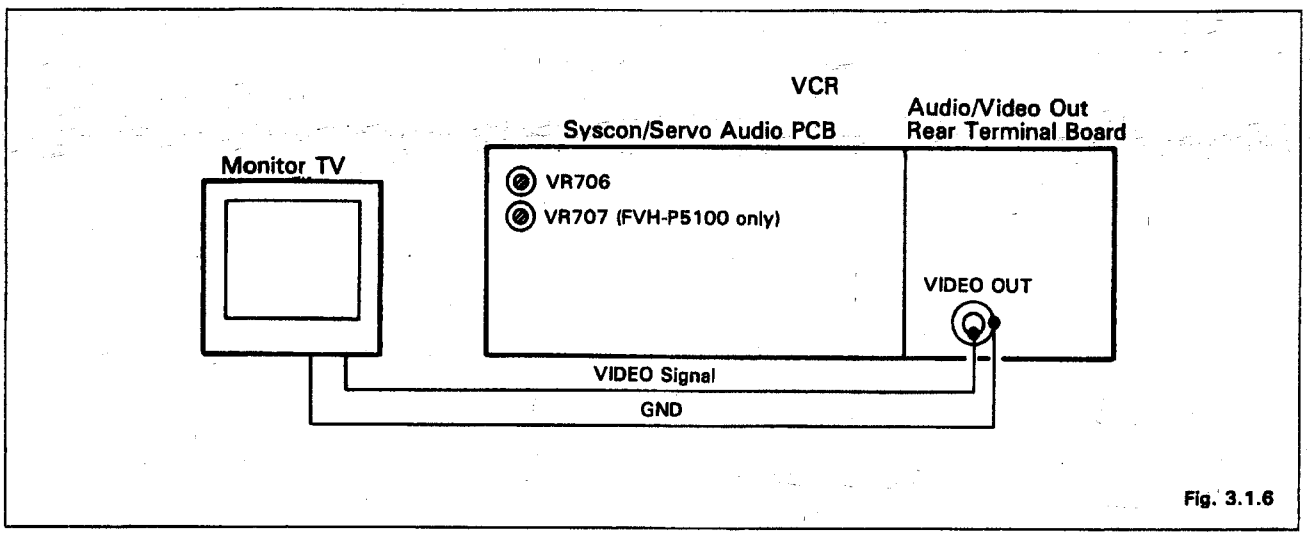


Fig. 3.1.6

[B] ADJUSTMENT BY ELECTRICAL WAVEFORM

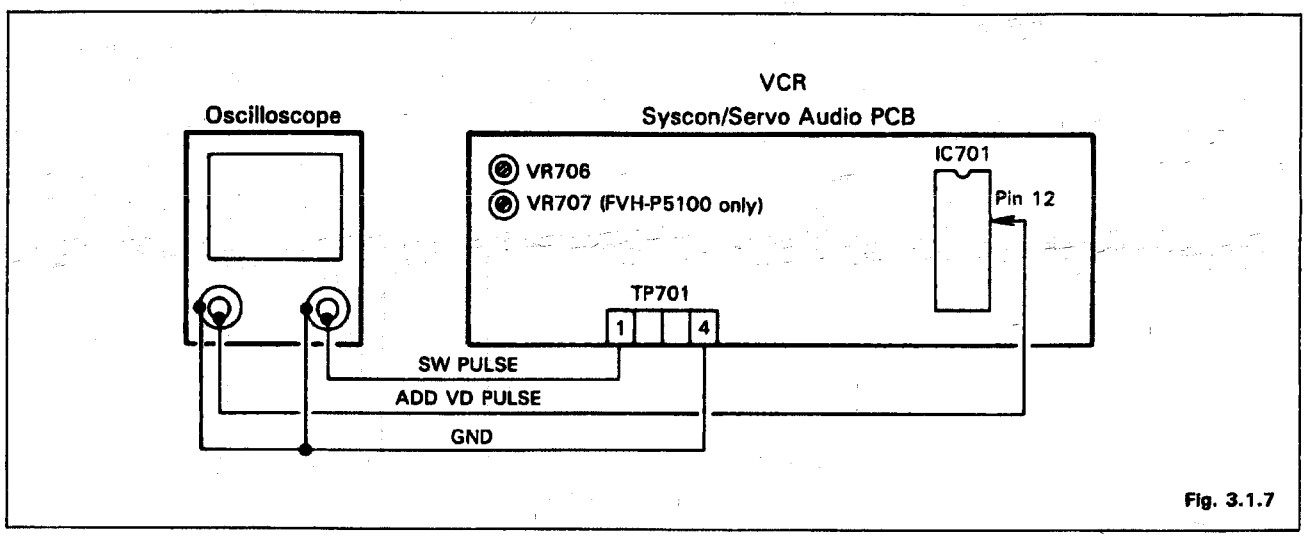


Fig. 3.1.7

3.1.4 ADJUSTMENTS

- For test equipment connecting diagrams for adjustments (1) through (4) in this section, refer to the corresponding diagrams (number in parentheses) in Section 3.1.3.

Note:
ADJ. is the abbreviation for adjustment in following section.

(1) CH1 PHASE/CH2 PHASE (PLAY MODE)

Measuring Point	Measuring Equipment	ADJ. Condition
Pin 1 of TP2 (PB204) (PB FM) (on Head Amp PC Assy) Pin 1 of TP701 (SW PULSE) Pin 4 of TP701 (GND) VIDEO OUTPUT terminal	Oscilloscope	PLAY mode Test Tape (VPM-6)

ADJ. Location	ADJ. Value
VR151 (TRACKING control knob)	Maximum level (PB FM Signal)
VR701 (CH1 PHASE)	6.5 H ± 0.5 H
VR702 (CH2 PHASE)	6.5 H ± 0.5 H

1. Adjust VR151 (TRACKING control knob) behind the door on the front panel so that the PB FM Signals for both CH1 and CH2 are brought to their maximum levels. (Refer to Fig. 3.1.8)

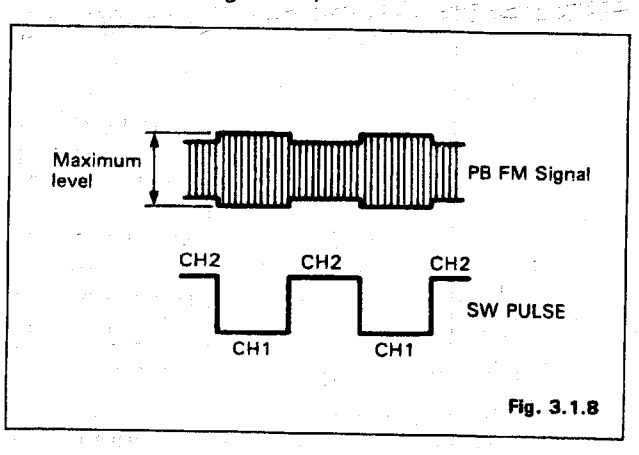


Fig. 3.1.8

2. Adjust VR701 (CH1 PHASE) so that the width "T_1" becomes **6.5 H ± 0.5 H** as shown in Fig. 3.1.9

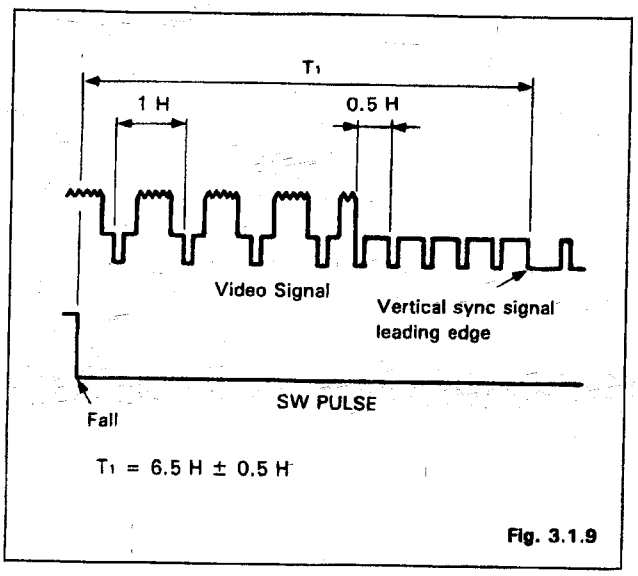


Fig. 3.1.9

3. Adjust VR702 (CH2 PHASE) so that the width "T_2" becomes **6.5 H ± 0.5 H** as shown in Fig. 3.1.10.

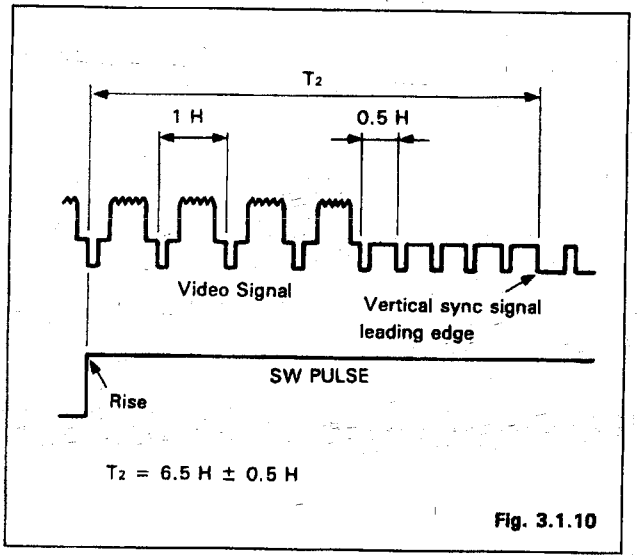


Fig. 3.1.10

(2) PLAY MODE TRACKING

Refer to Section 5.2.4 (AUDIO CONTROL ERASE HEAD) before making these adjustments.

Measuring Point	Measuring Equipment	ADJ. Condition
Pin 1 of TP701 (SW PLUSE) Pin 2 of TP701 (CTL PULSE) Pin 4 of TP701 (GND)	Oscilloscope	PLAY mode Test tape (VPM-6)

ADJ. Location	ADJ. Value
VR703 (NORMAL TRACK)	410 μsec ± 200 μsec

1. Adjust VR151 (TRACKING control knob) behind the door on the front panel to its centre (detent) position.
2. Adjust VR703 (NORMAL TRACK) for **410 μsec ± 200 μsec** as shown in Fig. 3.1.11.

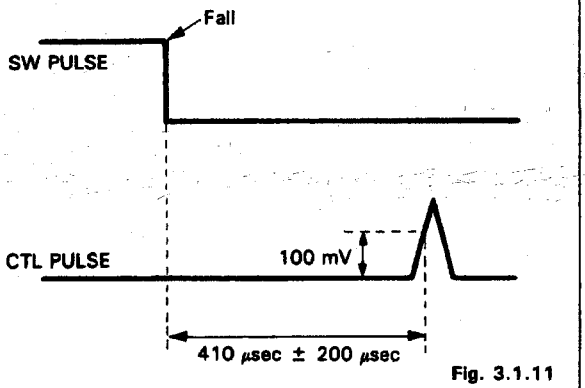


Fig. 3.1.11

(3) X VALUE

Refer to Section 5.2.4 (AUDIO CONTROL ERASE HEAD) before making these adjustments.

Measuring Point	Measuring Equipment	ADJ. Condition
Pin 1 of TP2 (PB204) (PB FM) (on Head Amp PC Assy) Pin 1 of TP701 (SW PULSE) Pin 4 of TP701 (GND)	Oscilloscope	PLAY mode Test tape (VPM-6)

ADJ. Location	ADJ. Value
X value adjustment nut	Maximul level (CH1 PB FM Signal)

1. Adjust VR151 (TRACKING control knob) behind the door on the front panel to its centre (detent) position.
2. Adjust the X value adjustment nut for the maximum PB FM Signal for CH1.
   (Refer to Fig. 3.1.12 and Fig. 3.1.13)
3. After adjusting the X value, check that the output level of the PB FM Signal for CH1 changes symmetrically, by rotating VR151 (TRACKING control knob) behind the door on the front panel.

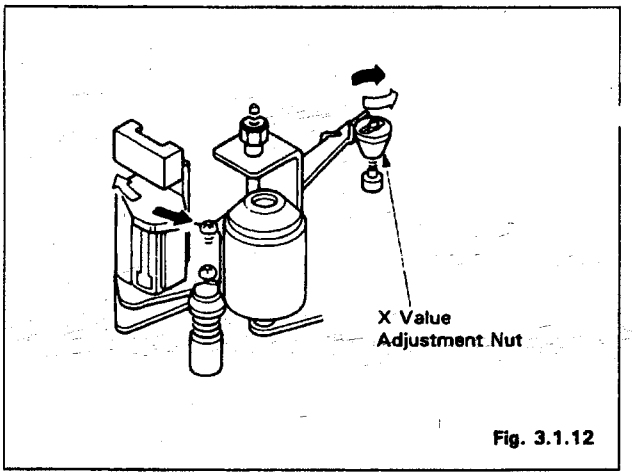


Fig. 3.1.12

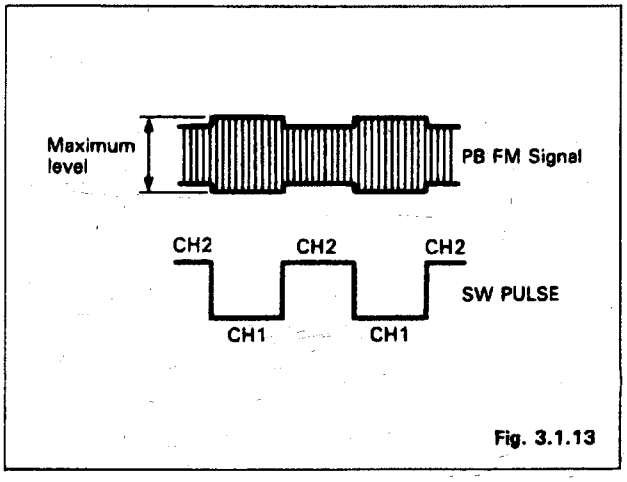


Fig. 3.1.13

Note:
If the audio control erase head adjustments (except the tilt adjustment) are carried out after these adjustments, repeat the procedures in Section 3.1.4 (2) PLAY MODE TRACKING and (3) X VALUE.

(4) V-ADDITIONAL PULSE

The [A] ADJUSTMENT BY THE PICTURE OF THE MONITOR TV should be made finally.
When this adjustment is made, the preceding adjustments (Section 3.1.4 (1), (2), (3)) should have been made.
If the electrical preadjustment is necessary, refer to [B] ADJUSTMENT BY THE ELECTRICAL WAVEFORM.

FVH-P5100 ONLY

Note: It is possible to use the STILL function and the SLOW function only with remote control operation.

[A] ADJUSTMENT BY THE PICTURE OF THE MONITOR TV

Measuring Point	Measuring Equipment	ADJ. Condition
Picture of monitor TV	Monitor TV	STILL mode Test tape (VPM-6)
		SLOW mode Test tape (VPM-6)

ADJ. Location	ADJ. Value
VR706 (STILL)	The minimum vertical shake
VR707 (SLOW)	

STILL MODE

1. Adjust VR706 (STILL) so that any vertical shake of the picture is brught to its minimum.

SLOW MODE

1. Adjust VR707 (SLOW) so that any vertical shake of the picture is brought to its minimum.

[B] ADJUSTMENT BY THE ELECTRICAL WAVEFORM

Measuring Point	Measuring Equipment	ADJ. Condition
Pin 1 of TP701 (SW PULSE) Pin 4 of TP701 (GND) Pin 12 of IC701 (ADD VD PULSE)	Oscilloscope	SLOW mode Test tape (VPM-6)

ADJ. Location	ADJ. Value
VR706 (STILL)	176 μsec ± 10 μsec
VR707 (SLOW)	176 μsec ± 10 μsec

1. Adjust VR706 (STILL) so that the width "B" becomes **176 μsec ± 10 μsec** as shown in Fig. 3.1.14.

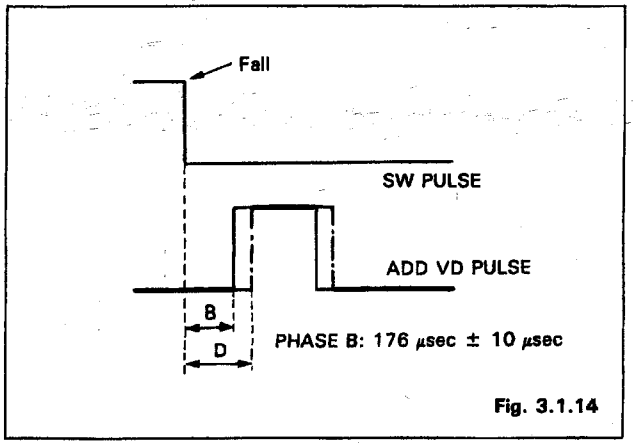


Fig. 3.1.14

2. Adjust VR707 (SLOW) so that the width "C" becomes **176 μsec ± 10 μsec** as shown in Fig. 3.1.15.

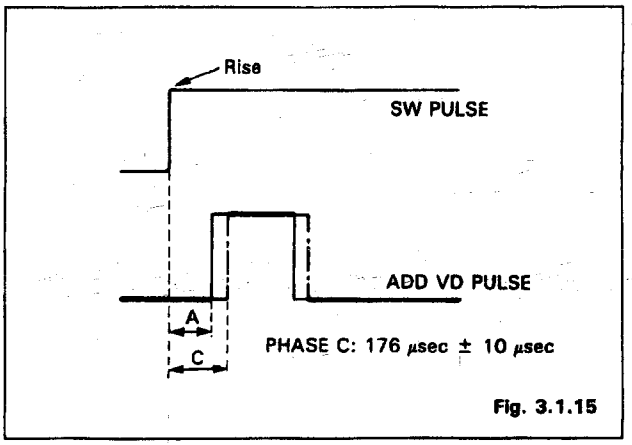


Fig. 3.1.15

Notes:
- PHASE A is fixed. (PHASE A: 128 μsec)
- PHASE D is adjusted automatically when PHASE C, B have been adjusted correctly. (PHASE D: 224 μsec)

FVH-P5000 ONLY

Note: It is possible to use the STILL function only with remote control operation.

[A] ADJUSTMENT BY THE PICTURE OF THE MONITOR TV

Measuring Point	Measuring Equipment	ADJ. Condition
Picture of monitor TV	Monitor TV	STILL mode Test tape (VPM-6)

ADJ. Location	ADJ. Value
VR706 (STILL)	The minimum vertical shake

1. Adjust VR706 (STILL) so that any vertical shake of the picture is brught to its minimum.

[B] ADJUSTMENT BY THE ELECTRICAL WAVEFORM

Measuring Point	Measuring Equipment	ADJ. Condition
Pin 1 of TP701 (SW PULSE) Pin 4 of TP701 (GND) Pin 12 of IC701 (ADD VD PULSE)	Oscilloscope	STILL mode Test Tape (VPM-6)

ADJ. Location	ADJ. Value
VR706 (STILL)	224 μsec ± 10 μsec

1. Adjust VR706 (STILL) for **224 μsec ± 10 μsec** as shown in Fig. 3.1.16.

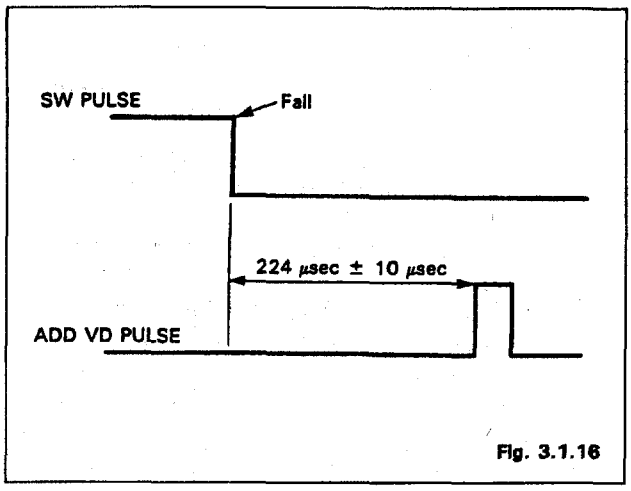


Fig. 3.1.16

3.2 VIDEO CIRCUIT

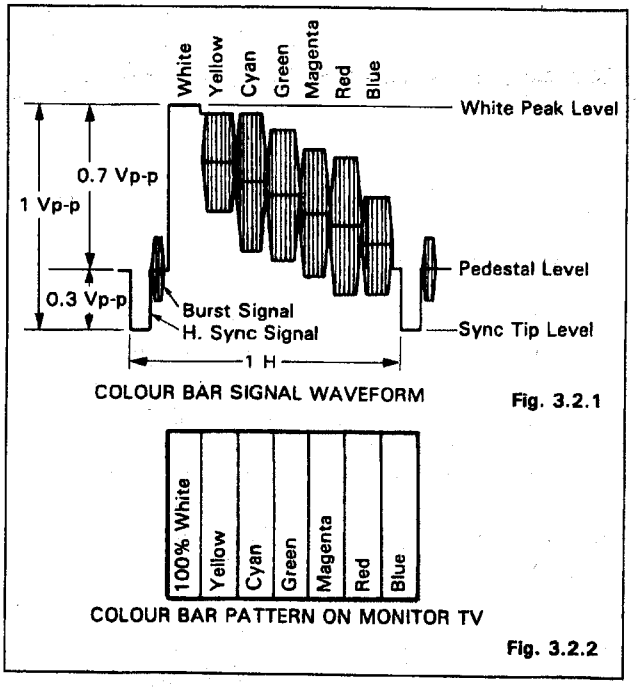
- Before making the following adjustments, Section 5 (MECANICAL Adjustment) and Section 3.1 (SYSTEM CONTROL SERVO CIRCUIT) adjustments should be completed.

3.2.1 TEST EQUIPMENT AND STANDARDS REQUIRED

Colour Bar Signal Generator	Colour bar signal with 100% white level (EBU colour bar signal) (Signal waveform is described below. Refer to Fig. 3.2.1)
Oscilloscope	Vertical sensitivity: 5 mV/DIV, easy trigger Band width: more than 20 MHz
Frequency Counter	Input frequency: 20 Hz ~ 10 MHz
Test Tape	VPC-1 (SVJ-00032): colour bar, 1 kHz (Colour bar signal waveform is described below. Refer to Fig. 3.2.3.) VPM-6 (SVJ-00031): Monoscope, 1 kHz
Blank Tape	VHS-type cassette tape
Oscilloscope Probe	Input capacity: less than 25 pF (10:1) less than 40 pF (1:1) Covering frequency: DC ~ 40 MHz (10:1) DC ~ 30 MHz (1:1)

PAL TV TEST SIGNAL

- Colour bar signal used for adjustment is specified as follows. The specification of the colour bar signal should be measured with the oscilloscope at terminated with a 75 Ω resistor.
  a) The amplitude of the sync signal should be approximately 0.3 Vp-p.
  b) The amplitude of the video signal should be approximately 0.7 Vp-p (100% White).
  c) The amplitude of the colour burst should be approximately 0.3 Vp-p.
  d) Confirm that there is no spike noise in the sync part of the horizontal sync signal.
  (Refer to Fig 3.2.1 and Fig. 3.2.2)
- Confirm that the colour bar signal from the test tape (VPC-1) at the VIDEO OUTPUT terminal is terminated with a 75 Ω load resistor when the oscilloscope is attached. (Refer to Fig. 3.2.3 and Fig. 3.2.4.)

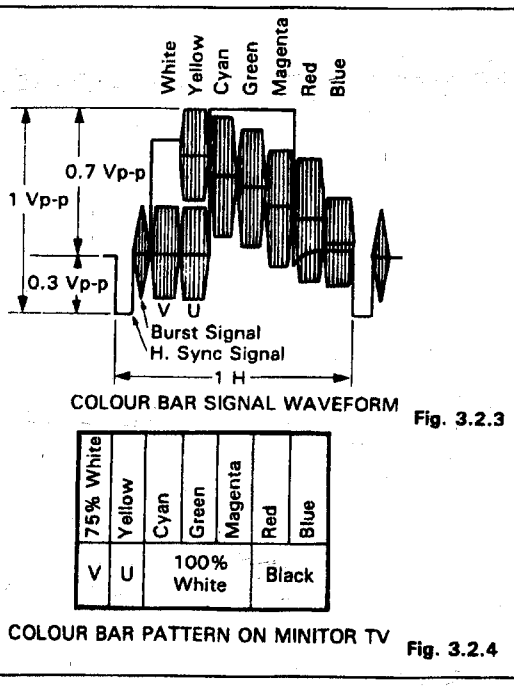


COLOUR BAR SIGNAL WAVEFORM

Fig. 3.2.1

COLOUR BAR PATTERN ON MONITOR TV

Fig. 3.2.2



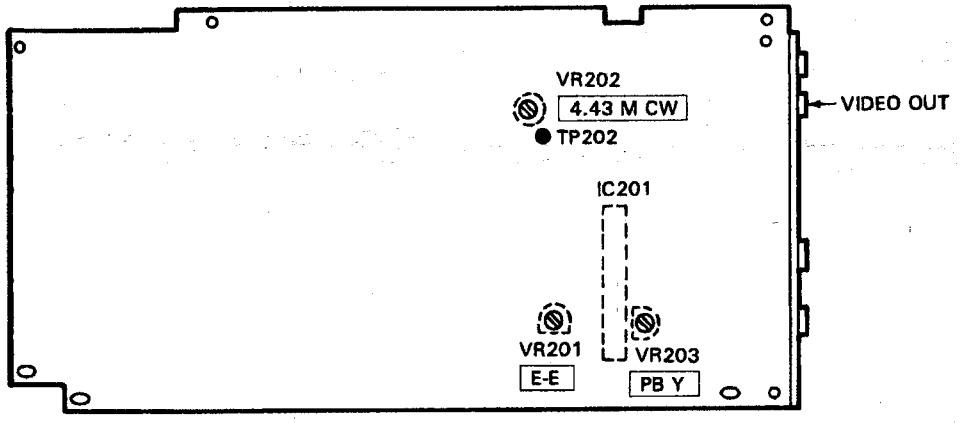
COLOUR BAR SIGNAL WAVEFORM

Fig. 3.2.3

COLOUR BAR PATTERN ON MINITOR TV

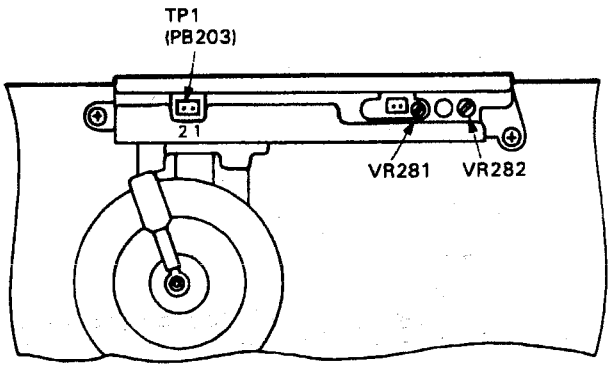
Fig. 3.2.4

3.2.2 LOCATION OF ADJUSTMENT POINTS



VIDEO VOLSYN PCB (FOIL SIDE)

Fig. 3.2.5



HEAD AMP PC ASSY

Fig. 3.2.6

3.2.3 TEST EQUIPMENT CONNECTING DIAGRAMS

For adjustments (1) through (4) in this section, refer to the corresponding paragraphs (number in parentheses) in Section 3.2.4.

(1) E-E LEVEL

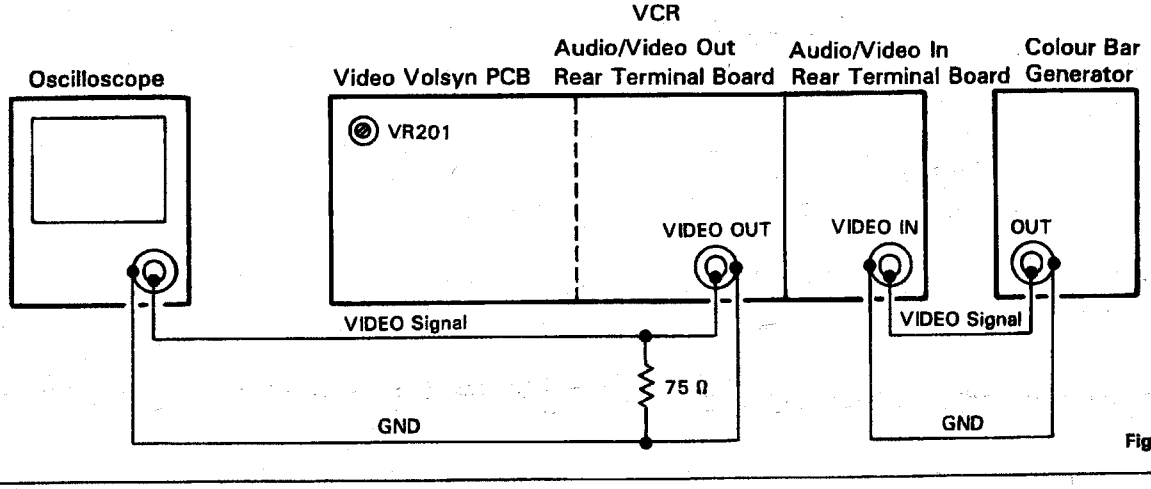


Fig. 3.2.7

(2) 4.43 MHz VCO

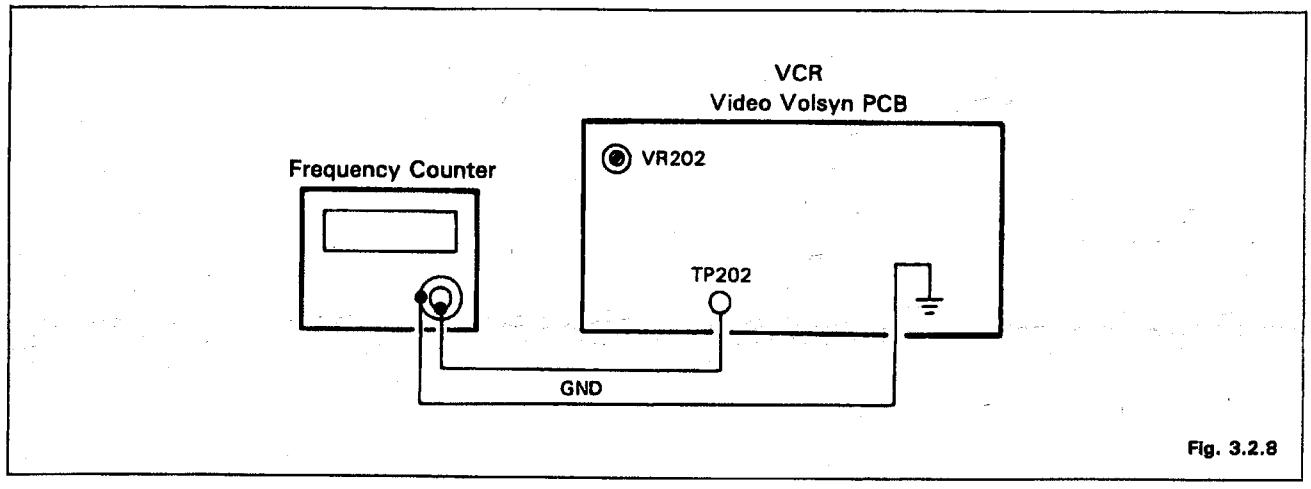


Fig. 3.2.8

(3) PB Y

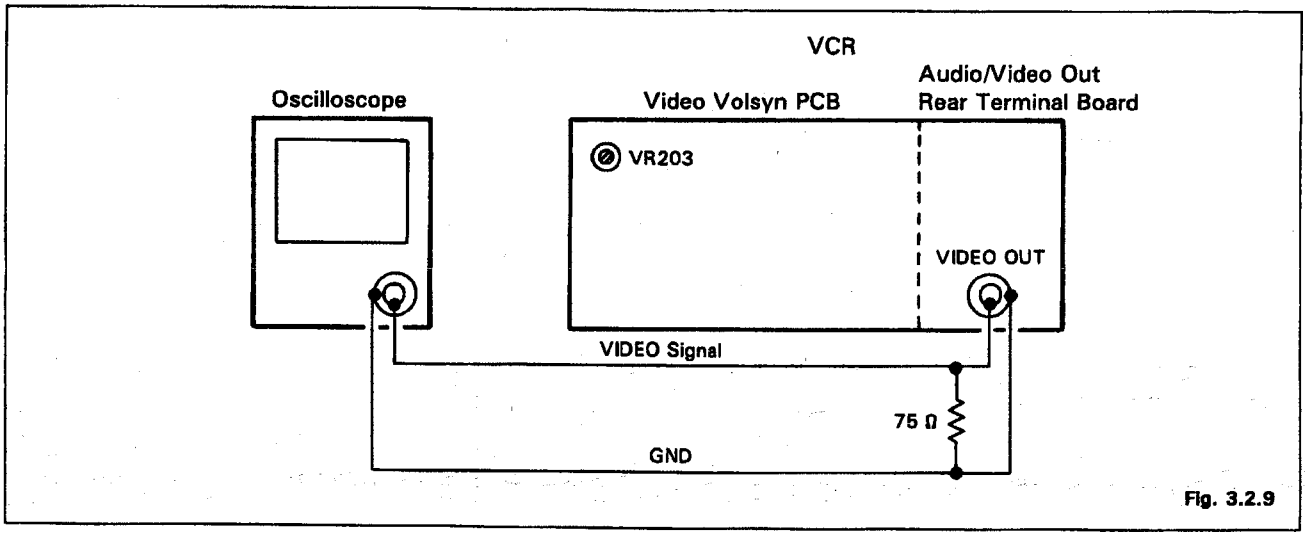


Fig. 3.2.9

(4) REC C/REC Y

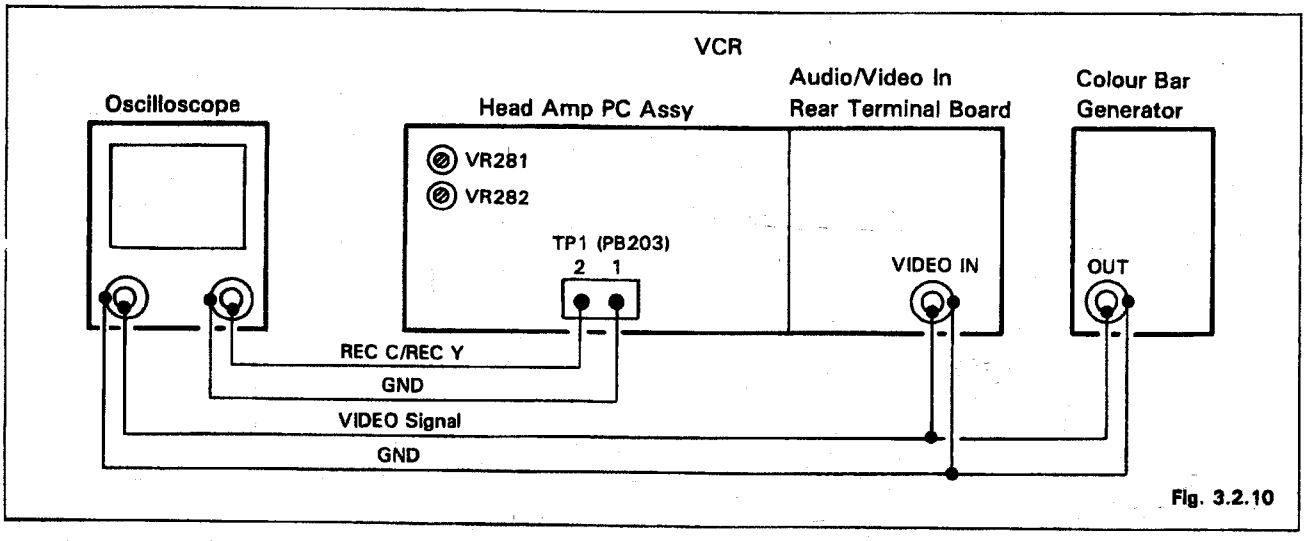


Fig. 3.2.10

3.2.4 ADJUSTMENTS

- For test equipment connecting diagrams for adjustments (1) through (4) in this section, refer to the corresponding digarams (number in parentheses) in Section 3.2.3.

Note:
- ADJ. is the abbreviation for adjustment in following section.

(1) E-E LEVEL

Measuring Point	Measuring Equipment	ADJ. Condition
VIDEO OUTPUT terminal	Oscilloscope Colour bar generator	E-E mode 75 Ω termination
ADJ. Location	**ADJ. Value**	
VR201 (E-E LEVEL)	1.0 Vp-p ± 50 mVp-p	

Notes:
- Connect the colour bar generator to VIDEO INPUT terminal. (Refer to Fig. 3.2.7)
- Terminate the VIDEO OUTPUT terminal with a 75 Ω resistor. (Refer to Fig. 3.2.7)

1. Adjust VR201 (E-E LEVEL) for the video luminance signal level of **1.0 Vp-p ± 50 mVp-p.** (Refer to Fig. 3.2.11).

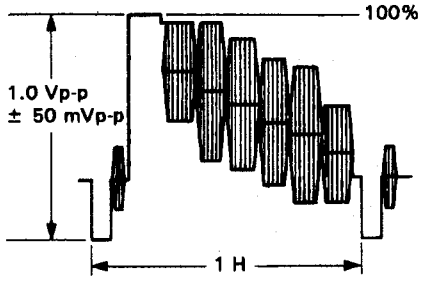


Fig. 3.2.11

(2) 4.43 MHz VCO

Measuring Point	Measuring Equipment	ADJ. Condition
TP202	Frequency Counter	PLAY mode Test Tape (VPM-6)
ADJ. Location	**ADJ. Value**	
VR202 (4.43 M CW)	4.433619 MHz ± 5 Hz	

1. Adjust VR202 (4.43 M CW) so that the frequency is **4.433619 MHz ± 5 Hz.**

(3) PB Y

Measuring Point	Measuring Equipment	ADJ. Condition
VIDEO OUTPUT terminal	Oscilloscope	PLAY mode Test tape (VPC-1)
ADJ. Location	**ADJ. Value**	
VR203 (PB Y)	1.0 Vp-p ± 50 mVp-p	

Note: Terminate the VIDEO OUTPUT terminal with a 75 Ω resistor. (Refer to Fig. 3.2.9)

1. Adjust VR203 (PB Y) for the video luminance signal level of **1.0 Vp-p ± 50 mVp-p.** (Refer ro Fig. 3.2.12)

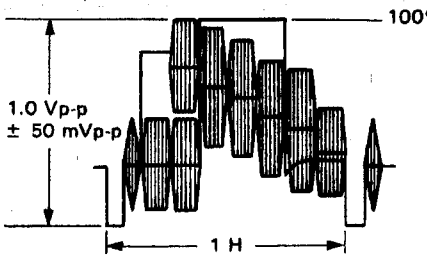


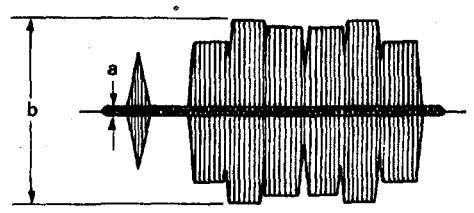
Fig. 3.2.12

(4) REC C/REC Y

Measuring Point	Measuring Equipment	ADJ. Condition
Pin 2 of TP1 (PB203) Pin 1 of TP1 (PB203) (GND) (on Head Amp PC Assy)	Colour bar generator Oscilloscope (1:1 probe for REC C, 10:1 probe for REC Y)	REC mode Blank tape
ADJ. Location	**ADJ. Value**	
VR282 (REC C)	20 mVp-p ± 2.5 mVp-p	
VR281 (REC Y)	140 mVp-p ± 5 mVp-p	

Notes:
- Connect the colour bar generator and the oscilloscope to VIDEO INPUT terminal.
- Apply the trigger at H. sync of the input video signal.

1. Adjust VR281 (REC Y) for the minimum video luminance signal level.
2. Adjust VR282 (REC C) so that the width "V" becomes **20 mVp-p ± 2.5 mVp-p** as shown in Fig. 3.2.13.



V = b − a = 20 mVp-p ± 2.5 mVp-p

Fig. 3.2.13

3. Adjust VR281 (REC Y) for the video luminnace signal level at the sync tip of **140 mVp-p ± 5 mVp-p.** (Refer to Fig. 3.2.14)

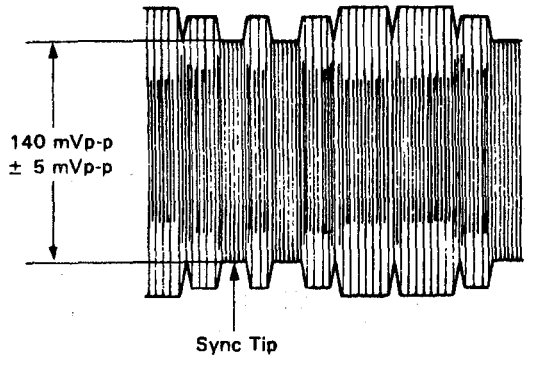


Fig. 3.2.14

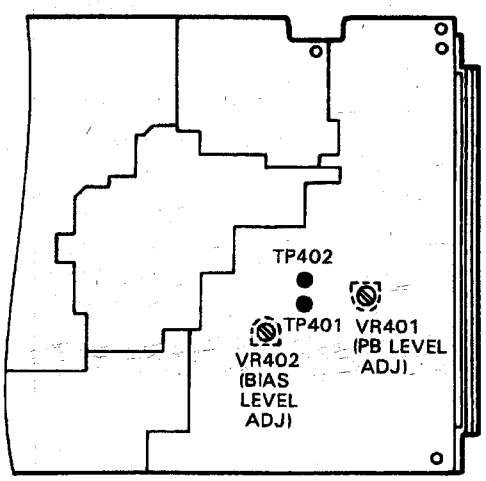
3.3 AUDIO CIRCUIT

- Prior to making these adjustments, Section 5 MECHANICAL ADJUSTMENTS (especially, the tape guide roller height, tape guide height and audio control erase head height adjustments) should be carried out, so that the tape traveling between the loading guide pole and the audio control erase head runs without fluttering, twisting or curling.
- Prior to making these adjustments, (except the audio control erase head adjustments), Section 3.1 SYSTEM CONTROL SERVO and Section 3.2 VIDEO circuit adjustments should be carried out.

3.3.1 TEST EQUIPMENT AND STANDARDS REQUIRED

Standard Audio Signal Generator (SG)	Output frequency : 10 Hz ~ 20 kHz Output level : more than 1 Vrms Output impedance : 600 Ω Distortion ratio : less than 0.1% Output in use SG : Frequency ..... 1 kHz, 10 kHz (switchable) Output level ..... −28 dBV ± 0.5 dB
Colour Bar Signal Generator	Colour bar signal with 100% white level. (Signal waveform is described before. Refer to Fig. 3.2.1)
Oscilloscope	Vertical sensitivity : 10 mV/DIV Band width : more than 30 MHz
AC Voltmeter	Effective value indication Input frequency : 10 Hz ~ 20 kHz Input Impedance : more than 1 MΩ Measurement level : 1 mV (full scale)
Test Tape	VPC-1 (SVJ-00032) : Colour bar, 1 kHz VPM-6 (SVJ-00031) : Monoscope, 6 kHz
Blank Tape	VHS-type cassette tape
Dummy Plug	RCA plug, HOT and COLD short-circuited
Adjustment Screw Drivers	1. ACE Head height adjustment box driver 2. Azimuth adjustment screw driver 3. Variable resistor adjustment screw driver

3.3.2 LOCATION OF ADJUSTMENT POINTS



SYSCON/SERVO AUDIO PCB (FOIL SIDE)

Fig. 3.3.1

3.3.3 TEST EQUIPMENT CONNECTING DIAGRAMS

For adjustments (1) through (4) in this section, refer to the corresponding paragraphs (number in parentheses) in Section 3.3.4

(1) ACE HEAD HEIGHT/ACE HEAD TILT

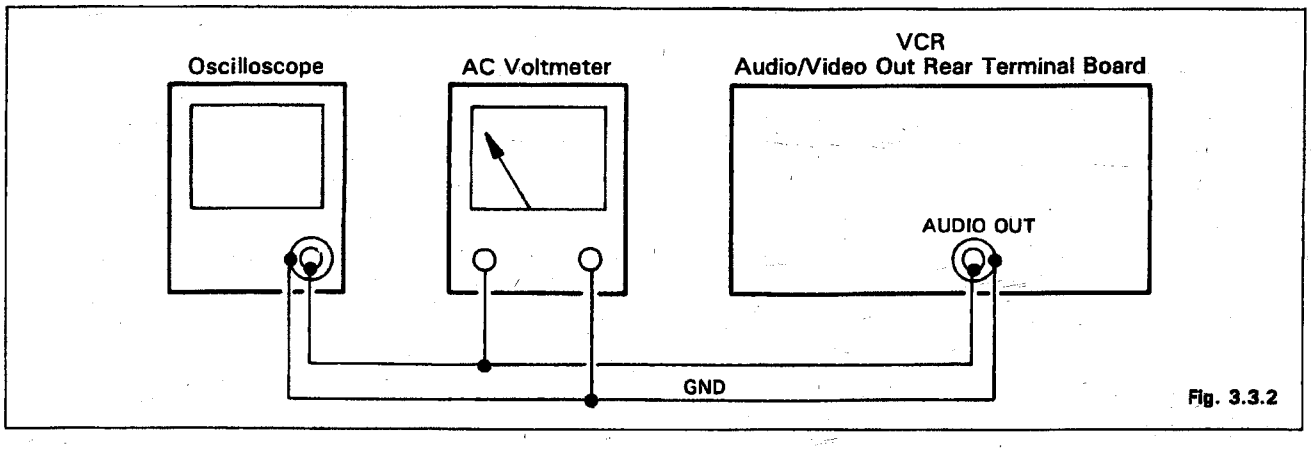


Fig. 3.3.2

(2) ACE HEAD AZIMUTH
Refer to Fig. 3.3.2.

(3) PLAY MODE LEVEL

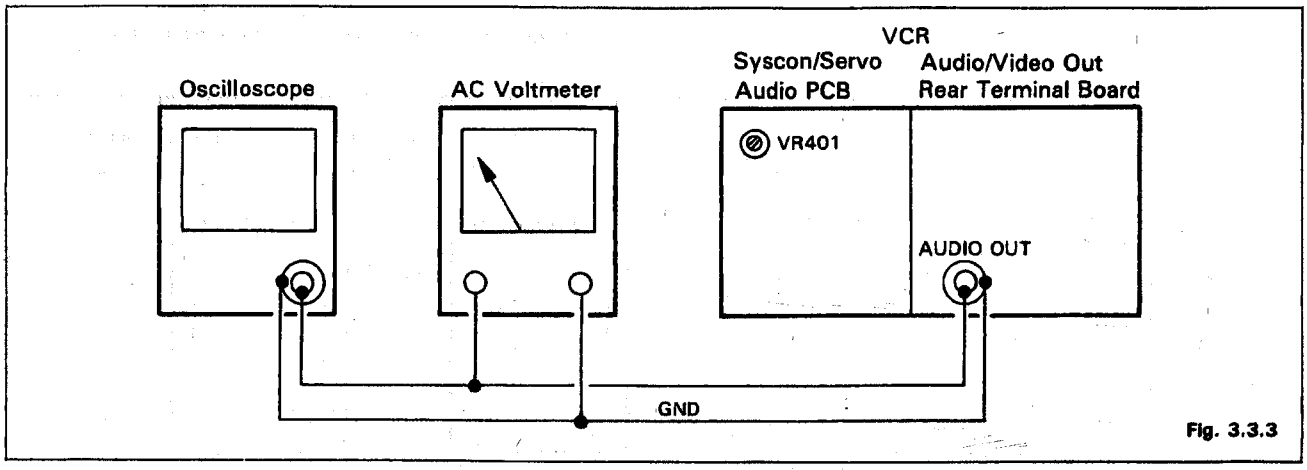
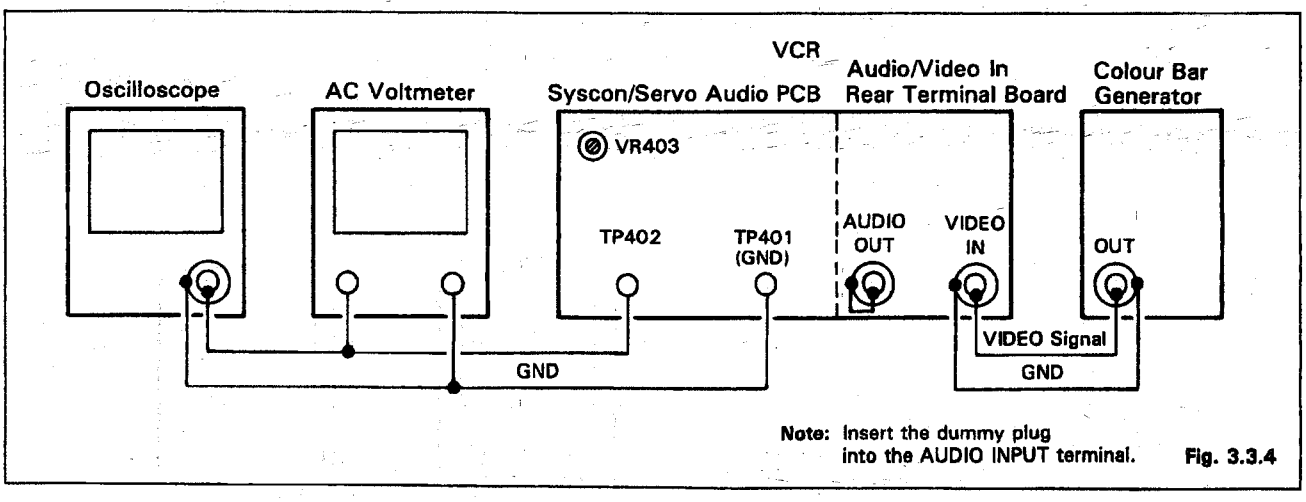


Fig. 3.3.3

(4) BIAS LEVEL
[A]



Note: Insert the dummy plug into the AUDIO INPUT terminal.

Fig. 3.3.4

[B]

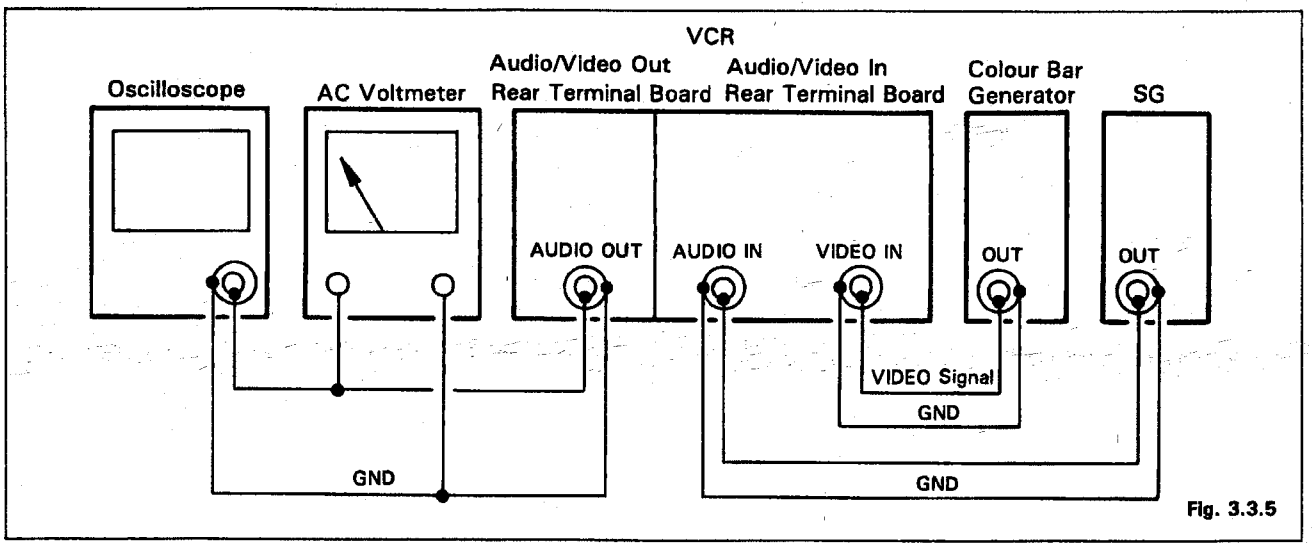


Fig. 3.3.5

3.3.4 ADJUSTMENTS

- For test equipment connecting diagrams for adjustments (1) through (4) in this section, refer to the corresponding diagrams (number in parentheses) in Section 3.3.3.

Notes:

- ADJ. is the abbreviation of adjustment in following section.
- Self-recording means "Record the AUDIO Signal and playback the just-recorded portion".

(1) ACE HEAD HEIGHT/ACE HEAD TILT

Refer to Section 5.2.4 (AUDIO CONTROL ERASE HEAD) before making these adjustments.

Measuring Point	Measuring Equipment	ADJ. Condition
AUDIO OUTPUT terminal	Oscilloscope AC voltmeter	PLAY (SP) mode Test tape (VPC-1)

ADJ. Location	ADJ. Value
Tilt adjustment screw	—
Height adjustment nut Azimuth adjustment screw	Maximum level (AC voltmeter)

1. Confirm that the tape running between the tape guide roller and ACE head has no slack. If the tape has slack, take it up by turning the tilt adjustment screw (Refer to Fig. 3.3.6). Then readjust GUIDE ROLLER HEIGHT (Refer to Section 5.2.3) and the X VALUE (Refer to Section 3.1.4 (3)).

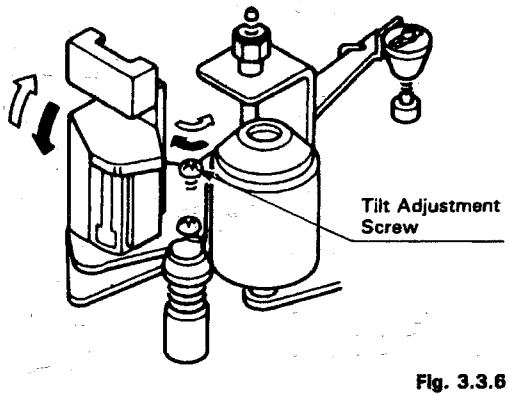


Fig. 3.3.6

2. After confirming on the oscilloscope that a 1 kHz sine wave is being output, adjust the height adjustment nut so that the AC voltmeter's reading is brought to its maximum level. (Refer to Fig. 3.3.7)

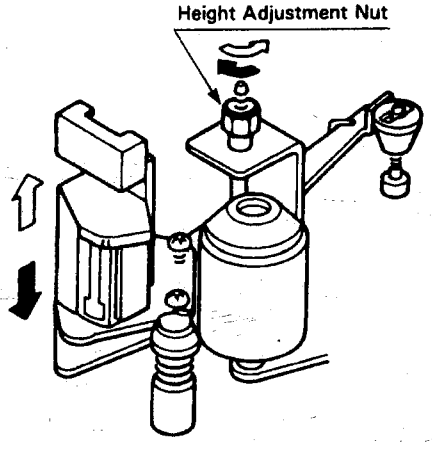


Fig. 3.3.7

3. Adjust the azimuth adjustment screw so that the AC voltmeter's reading is brought to its maximum level. (Refer to Fig. 3.3.8)

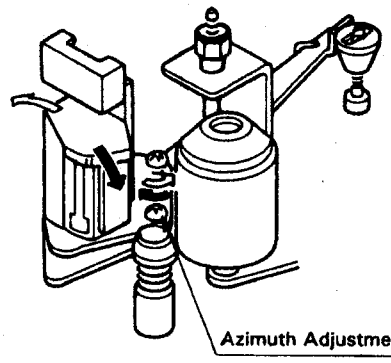


Fig. 3.3.8

4. If the AC voltmeter's reading in step 2 increased more than 2 dB after step 3, perform step 2 again.

Note: The maximum reading on the AC volmeter obtained in steps 2 and 3 is approxmately −10 dBV.

(2) ACE HEAD AZIMUTH

Refer to Section 5.2.4 (AUDIO CONTROL ERASE HEAD) before making these adjustments.

Measuring Point	Measuring Equipment	ADJ. Condition
VIDEO OUTPUT terminal	Oscilloscope AC voltmeter	PLAY mode Test tape (VPM-6)
ADJ. Location	**ADJ. Value**	
Azimuth adjustment screw	Maximum level (AC voltmeter)	

1. After confirming on the oscilloscope that a 6 kHz sine wave is being output, adjust the azimuth adjustment screw so that the AC voltmeter's reading or oscilloscope waveform is brought to its maximum level. (Refer to Fig. 3.3.8)

Note: The maximum reading on the AC voltmeter obtained in step 1 should be be more than −5 dB below the value given in Section 3.3.4 (1).

(3) PLAY MODE LEVEL

Measuring Point	Measuring Equipment	ADJ. Condition
VIDEO OUTPUT terminal	Oscilloscope AC voltmeter	PLAY mode Test tape (VPC-1)
ADJ. Location	**ADJ. Value**	
VR401 (PB LEVEL ADJ.)	−10 dBV ± 1 dB	

1. After confirming on the oscilloscope that a 1 kHz sine wave is being output, adjust VR401 (PB LEVEL ADJ.) so that the AC voltmeter's reading is **−10 dBV ± 1 dB.**

(4) BIAS LEVEL

[A]

Measuring Point	Measuring Equipment	ADJ. Condition
TP402 TP401 (GND)	Colour bar generator Oscilloscope AC voltmeter	REC mode Blank tape
ADJ. Location	**ADJ. Value**	
VR402 (BIAS LEVEL ADJ.)	16 mVrms ± 2 mVrms	

Notes:
- Connect the colour bar generator to AUDIO INPUT terminal. (Refer to Fig. 3.3.4)
- Insert the dummy plug in to the AUDIO INPUT terminal. (Refer to Fig. 3.3.4)

1. After confirming on the oscilloscope that a 70 kHz sine wave is being output, adjust VR402 (BIAS LEVEL ADJ.) so that the AC voltmeter's reading is **16 mVrms ± 2 mVrms.**

[B]

Measuring Point	Measuring Equipment	ADJ. Condition
AUDIO OUTPUT terminal	Oscilloscope AC voltmeter Standard audio signal generator (SG) Colour bar generator	Self-recording Blank tape
ADJ. Location	**ADJ. Value**	
VR402 (BIAS LEVEL ADJ.)	−2 dB ~ +2 dB between 1 kHz and 10 kHz	

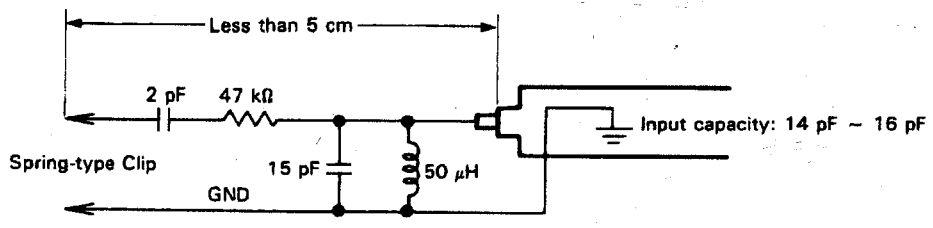
Notes:
- Connect the colour bar generator to AUDIO INPUT terminal.
- Connect the standard audio signal generator to AUDIO INPUT terminal. (Refer to Fig. 3.3.5)

1. Set the standard audio signal generator's frequency to 1 kHz and then 10 kHz. Record each frequency's signals.
2. Playback the just-recorded portion.
3. Confirm that the difference between AC voltmeter's readings for the 1 kHz and 10 kHz signals is **between −2 dB ~ +2 dB.**
4. If the difference is under −2 dB, rotate VR402 (BIAS LEVEL ADJ.) slightly clockwise (seeing from the foil side) to adjust it.
5. If the difference is over +2 dB, rotate VR402 (BIAS LEVEL ADJ.) slightly counterclockwise (seeing from the foil side) to adjust it.
6. Repeat steps 1 through 5, if necessary.

3.4 TIMER CIRCUIT

3.4.1 TEST EQUIPMENT AND STANDARDS REQUIRED

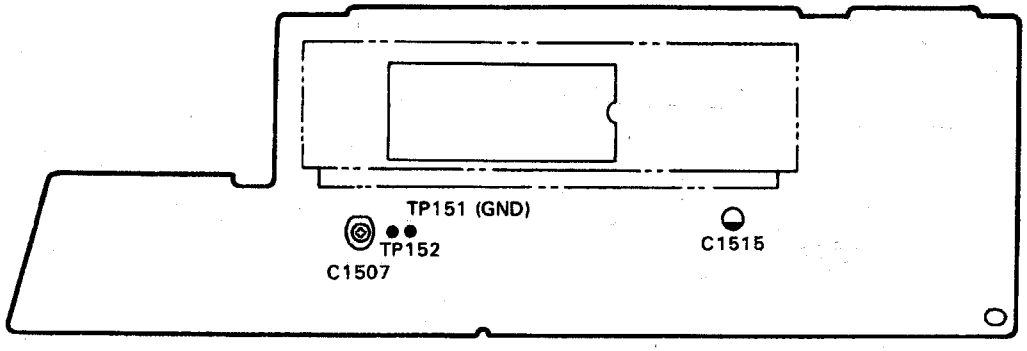
Universal Counter	8 significant digits
Oscilloscope	
DC voltmeter	
Probe	Modified Probe (Refer to Fig. 3.4.1)



PROBE CONFIGURATION

Fig. 3.4.1

3.4.2 LOCATION OF ADJUSTMENT POINTS



FRONT RIGHT PCB (PARTS SIDE)

Fig. 3.4.2

3.4.3 TEST EQUIPMENT CONNECTING DIAGRAMS

For adjustments (1) through (2) in this section, refer to the corresponding paragraphs (number in parentheses) in Section 3.4.4.

(1) VOLTAGE TEST

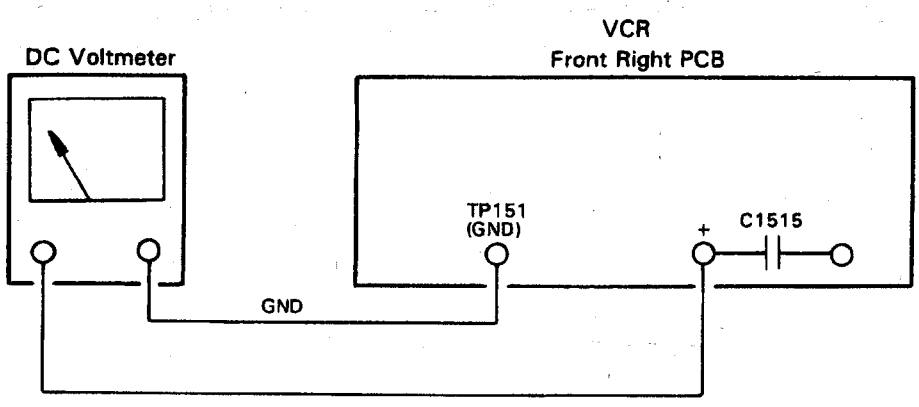


Fig. 3.4.3

(2) CRTC CLOCK FREQUENCY

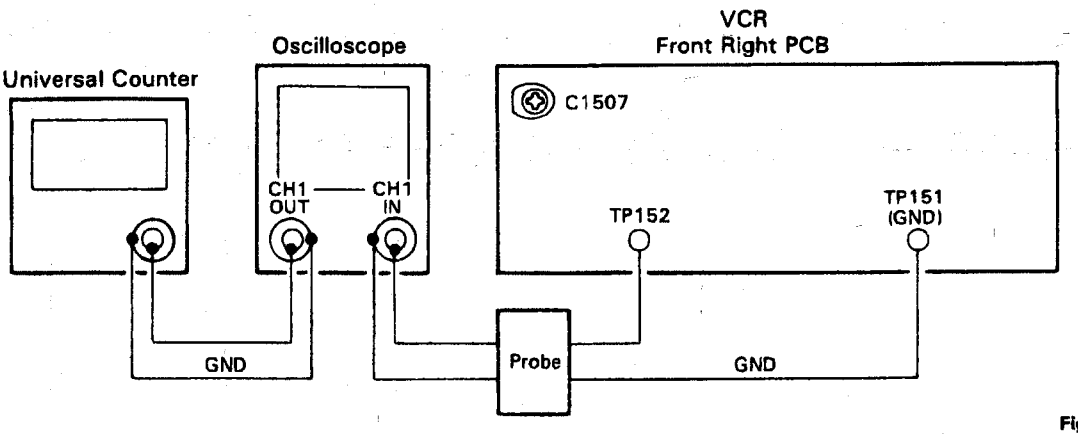


Fig. 3.4.4

3.4.4 ADJUSTMENTS

- For test equipment connecting diagrams for adjustments (1) through (2) in this section, refer to the corresponding diagrams (number in parentheses) in Section 3.4.3.

Note:
ADJ. is the abbreviation of adjustment in following section.

(1) VOLTAGE TEST

Measuring Point	Measuring Equipment	ADJ. Condition
Positive side of C1515 TP151 (GND)	DC voltmeter	E-E mode

ADJ. Location	ADJ. Value
	4.4 V ~ 4.6 V

VOLTAGE TEST OF POSITIVE SIDE OF C1515

1. Check that the DC voltmeter's reading is **between 4.4 V and 4.6 V.**

(2) CRTC CLOCK FREQUENCY

Measuring Point	Measuring Equipment	ADJ. Condition
TP152 TP151 (GND)	Universal counter Oscilloscope Modified probe	E-E mode

ADJ. Location	ADJ. Value
C1507	4.194304 MHz ± 20 Hz (Monthly allowance ± 15 sec)

1. Set the universal counter to the frequency mode, accurate to 8 significant digits.
2. Adjust C1507 until the counter indicates a frequency of **4.194304 MHz ± 20 Hz.** (Montly allownce ± 15 sec).

3.5 TUNER IF CIRCUITS

- When any malfunction occurs in the TUNER circuit, the whole unit must be replaced.

Note: The TUNER unit does not need any adjustments, because precise adjustments have been performed before shipment.

- An adjustment of the IF circuit is shown as follows.

3.5.1 TEST EQUIPMENT AND STANDARD REQUIRED

Monitor TV	

3.5.2 LOCATION OF ADJUSTMENT POINT

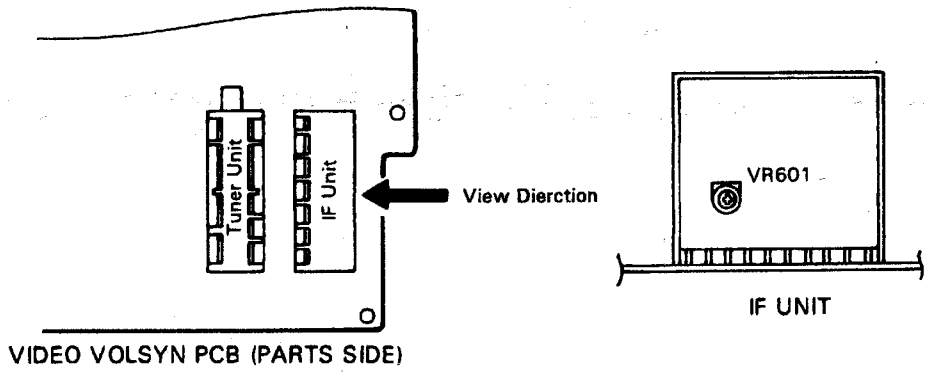


Fig. 3.5.1

3.5.3 TEST EQUPMENT CONNECTING DIAGRAM

For adjustment (1) in this section, refer to the corresponding paragraph (number in parentheses) in Section 3.5.4.

(1) RF AGC

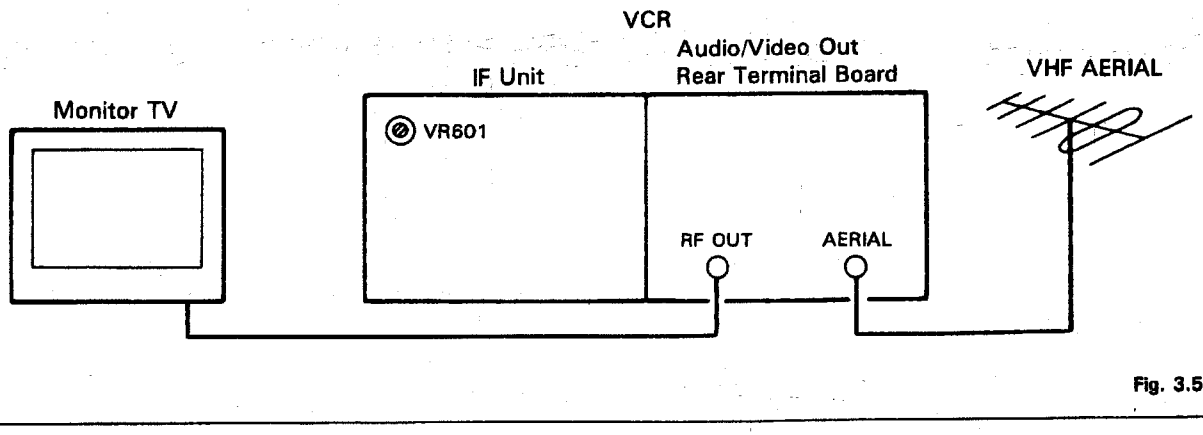


Fig. 3.5.2

3.5.4 ADJUSTMENT

- For test equipment connecting diagram for an adjustment (1) in this section, refer to the corresponding diagram (number in parentheses) in Section 3.5.3.

Note:
ADJ. is the abbreviation for adjustment in following section.

(1) RF AGC

Measuring Point	Measuring Equipment	ADJ. Condition
Picture of monitor TV	Monitor TV	E-E mode

ADJ. Location	ADJ. Value
VR601 (on the IF circuit)	S/N is best point

1. Receive the middle electrical field (60 dB ~ 80 dB) of the VHF high channel, and slowly turn VR601 from the point where snow-noise is present to the point where it just disappears from the monitor TV.
2. Confirm by monitor TV that there is no beat and saturation (S/N is best point) when receiving any TV channel.

3.6 ON-SCREEN CIRCUIT (SPECIAL ADJUSTMENT FOR THE MODEL FVH-P5100)

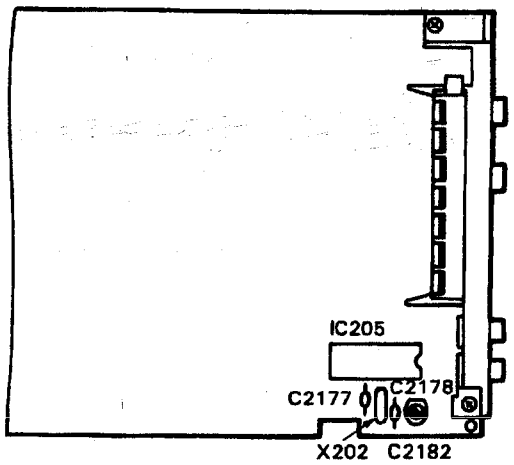
The model FVH-P5100 is basically the same as the model FVH-P5000, but adjustment of On-Screen is necessary.

Note: Adjust the On-Screen Circuit especially when IC205, X202, C2177, C2178 and C2182 are replacement.

3.6.1 TEST EQUIPMENT AND STANDARDS REQUIRED

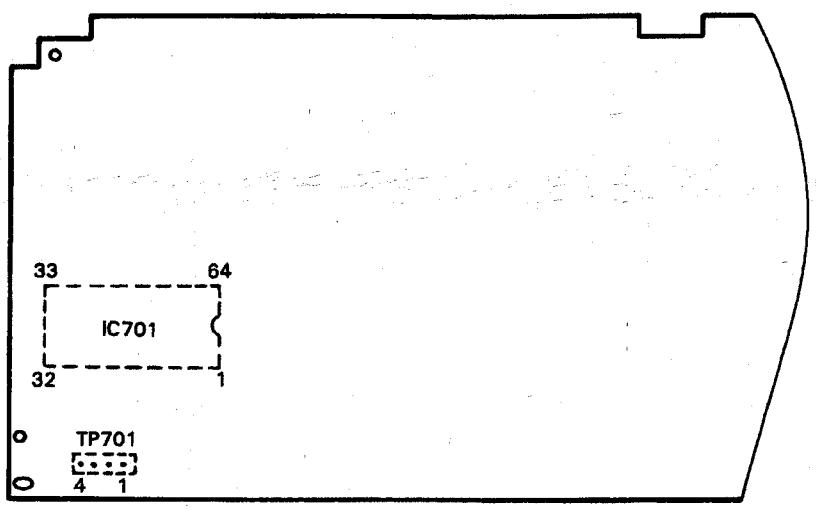
Frequency Counter	
Remote Control Unit	RVR-550E
Probe	10:1 probe

3.6.2 LOCATION OF ADJUSTMENT POINT



VIDEO VOLSYN PCB (PARTS SIDE)

Fig. 3.6.1



SYSCON/SERVO AUDIO PCB (FOIL SIDE)

Fig. 3.6.2

3.6.3 TEST EQUIPMENT CONNECTING DIAGRAM

For adjustments (1) in this section, refer to the corresponding paragraph (number in parentheses) in Section 3.6.4.

(1) ON-SCREEN

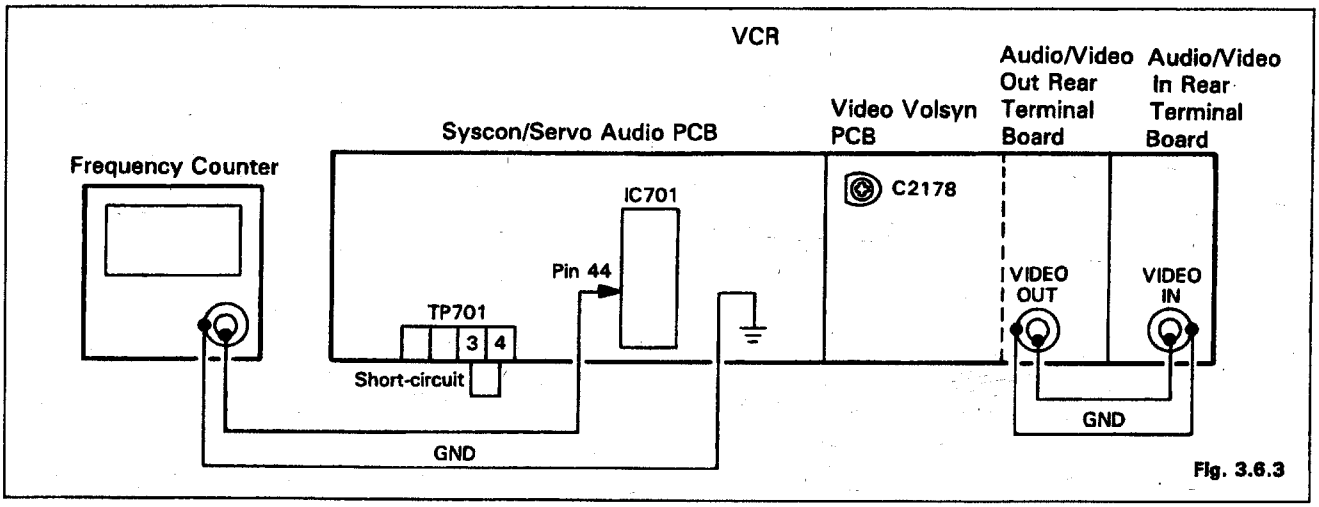


Fig. 3.6.3

3.6.4 ADJUSTMENT

- For test equipment connecting diagram for an adjustment (1) in this section, refer to the corresponding diagram (number in parentheses) in Section 3.6.3.

Note:

- ADJ. is the abbreviation for adjustment in following section.

(1) ON-SCREEN

Measuring Point	Measuring Equipment	ADJ. Condition
Pin 44 of IC701 (on Syscon/Servo Audio PCB)	Frequency counter (10:1 probe)	Program mode (Remote control: RVR-550E)

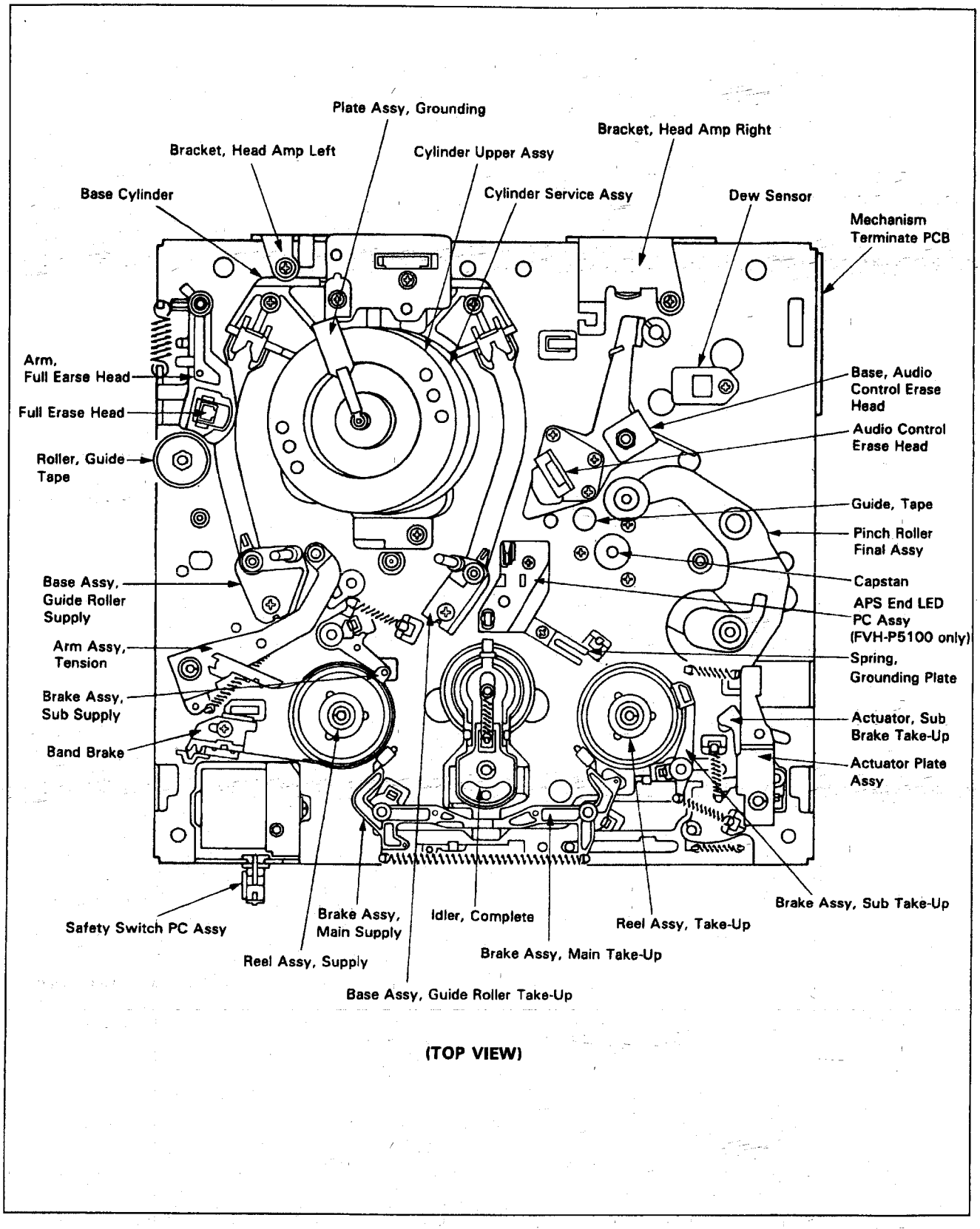
ADJ. Location	ADJ. Value
C2178	4.433619 MHz ± 5 Hz

Notes:
- Short-circuit pins 3 (F REC) and 4 (GND) of TP701.
- Connect the VIDEO INPUT terminal to the VIDEO OUTPUT terminal. (Refer to Fig. 3.6.3)

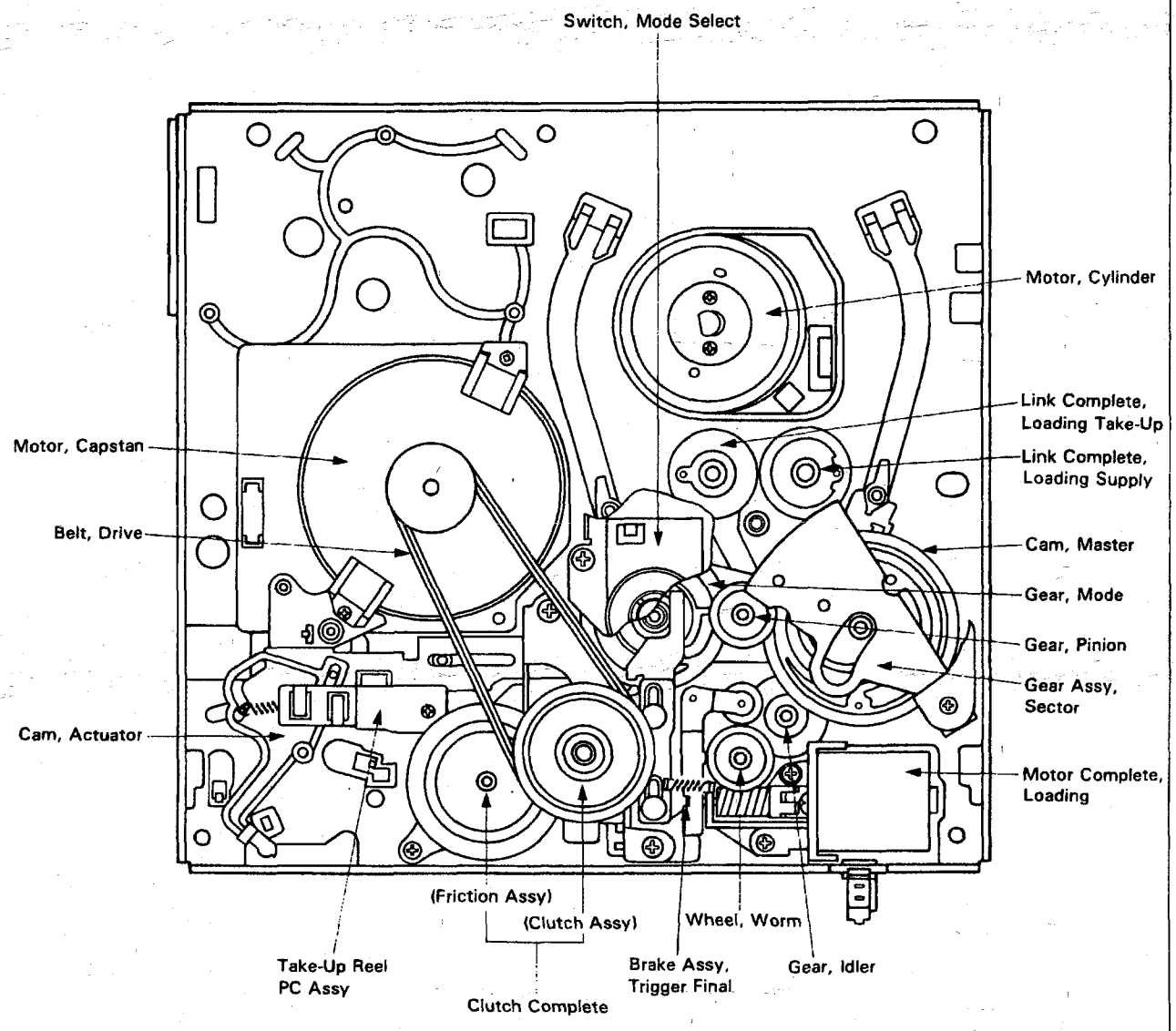
1. Adjust C2178 until the counter indicates a frequency of **4.433619 MHz ± 5 Hz.**

4. MECHANICAL DISASSEMBLY

4.1 MECHANICAL PARTS LOCATIONS



(TOP VIEW)


Switch, Mode Select
Motor, Cylinder
Link Complete, Loading Take-Up
Link Complete, Loading Supply
Motor, Capstan
Belt, Drive
Cam, Master
Gear, Mode
Gear, Pinion
Gear Assy, Sector
Cam, Actuator
Motor Complete, Loading
(Friction Assy)
(Clutch Assy)
Wheel, Worm
Take-Up Reel PC Assy
Brake Assy, Trigger Final
Gear, Idler
Clutch Complete

(BOTTOM VIEW)

4.2 MAIN MECHANICAL PARTS DISASSEMBLY

1. When disassembling the unit, making replacements or adjustments, or cleaning parts, set the power switch to OFF before proceeding.
2. The parts shown in Fig. 4.2.1 were secured after having been adjusted at the manufacturing plant with precision jigs. These parts should not be removed or adjusted since this will make the tape running adjustments more difficult to perform.

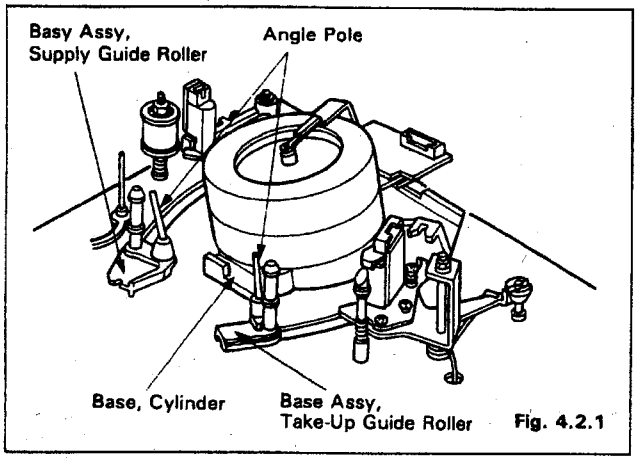


Fig. 4.2.1

3. When removing the following parts, remove screws, nuts or washers in numerical order.
   If necessary, disconnect the connectors.
   When reassembling, reverse the order of disassembly.
4. Do not touch the tape transport area of the parts with bare hands.
   If a tape transport area is touched with bare hands, clean it with cleaning fluid and chamois.

4.2.1 STAGE

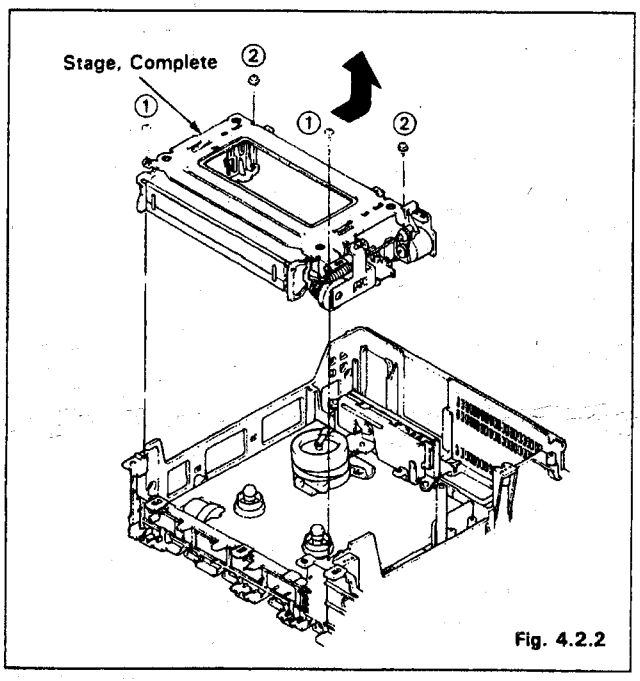


Fig. 4.2.2

4.2.2 MAIN CHASSIS

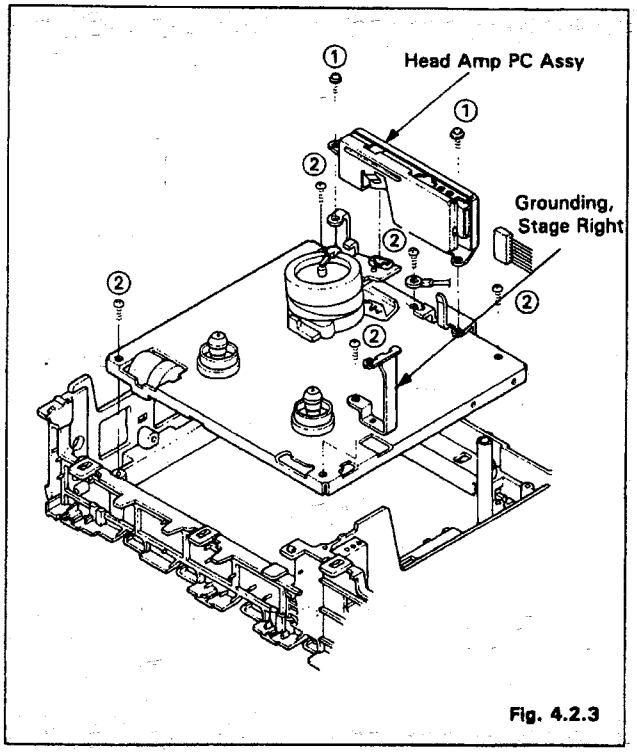


Fig. 4.2.3

4.2.3 SUPPLY REEL/TAKE-UP REEL

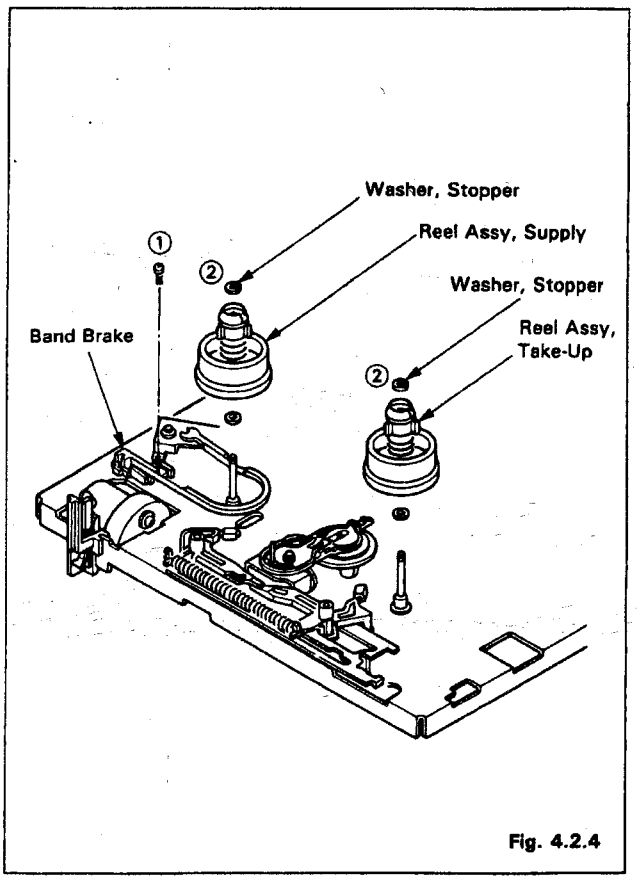


Fig. 4.2.4

4.2.4 AUDIO CONTROL ERASE HEAD

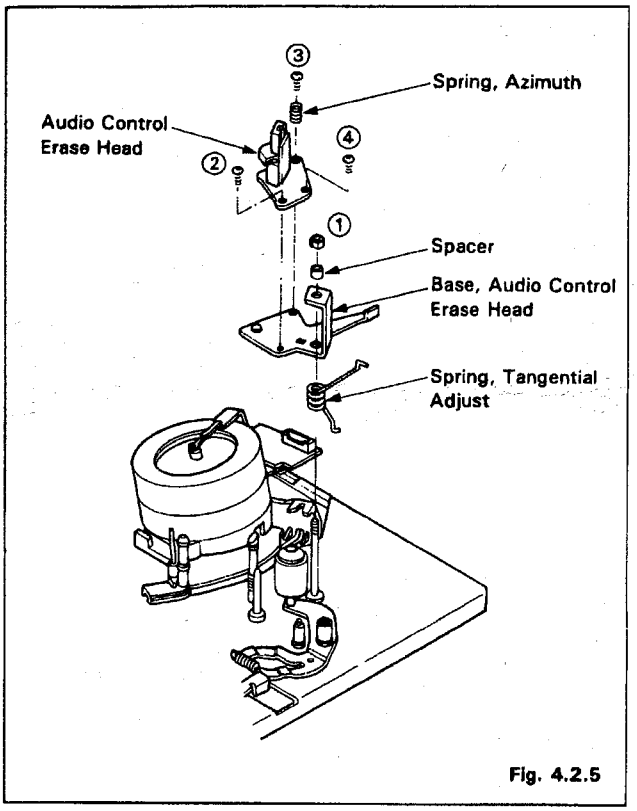


Fig. 4.2.5

4.2.5 FULL ERASE HEAD AND TAPE GUIDE ROLLER

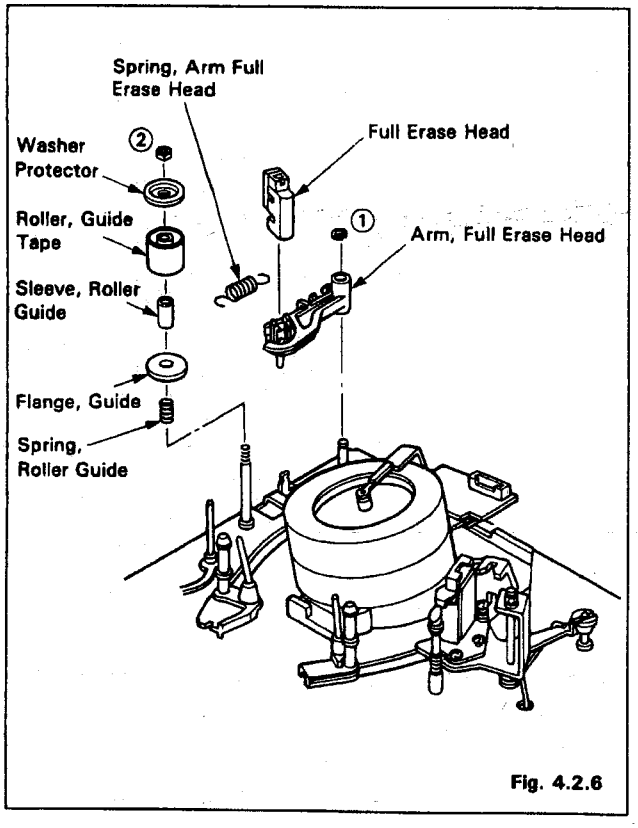


Fig. 4.2.6

4.2.6 CAPSTAN MOTOR

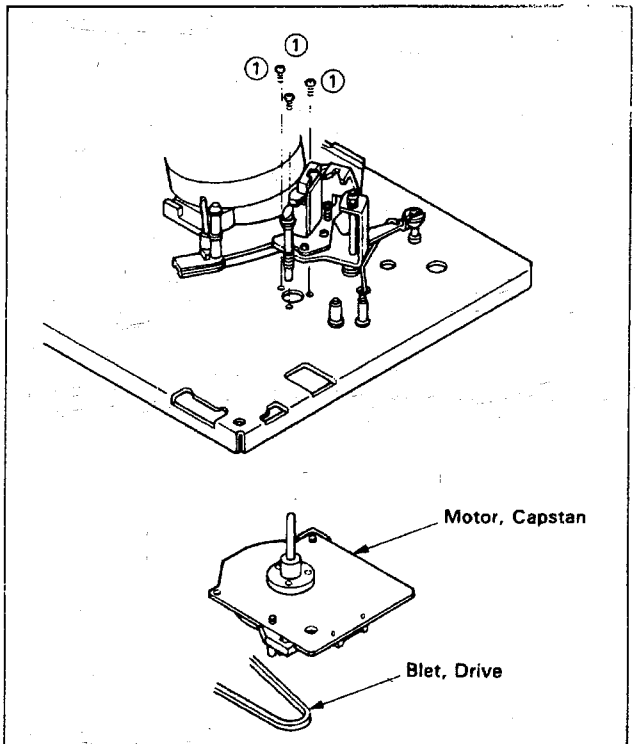


Fig. 4.2.7

4.2.7 LOADING MOTOR

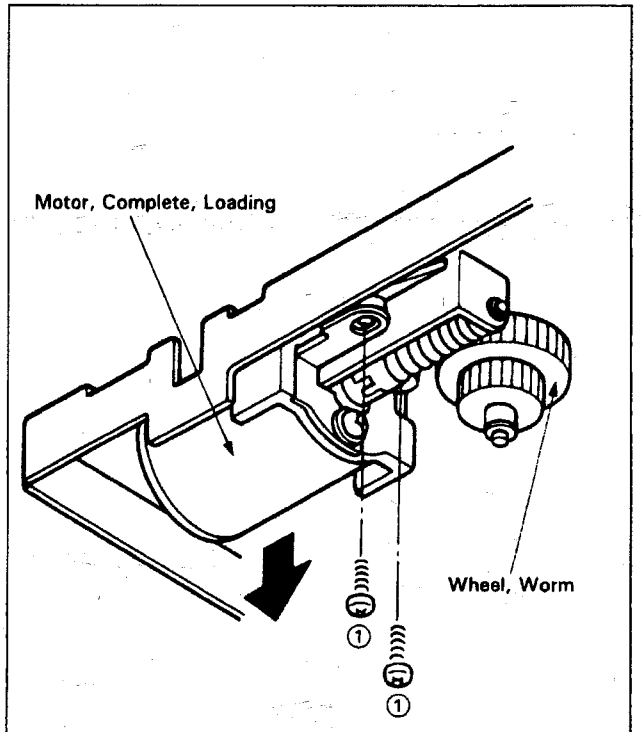


Fig. 4.2.8

4.2.8 LOADING/UNLOADING MECHANISM

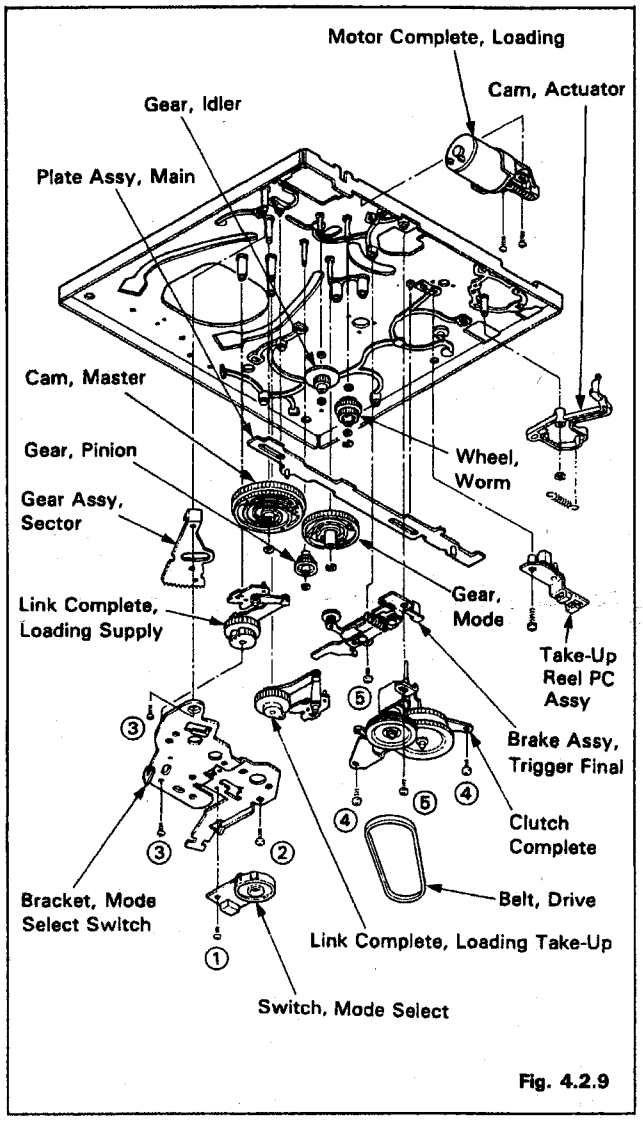


Fig. 4.2.9

When installing the master cam, insert the pin of the main plate into the appropriate position in the master cam. (Refer to Fig. 4.2.10)

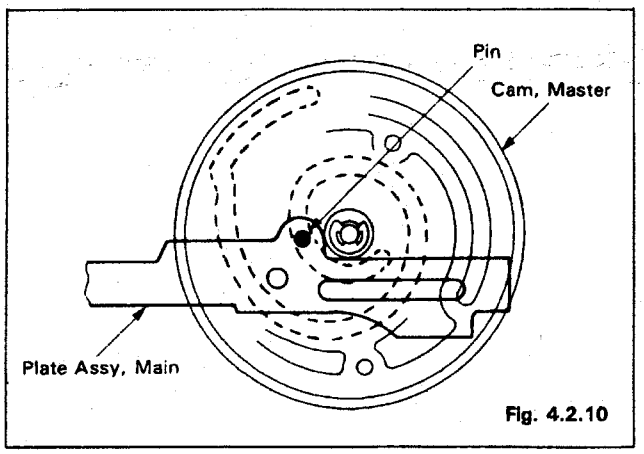


Fig. 4.2.10

When reassembling, positioning the parts in following order.

1. Match the mark on the supply loading gear and the take-up loading gear, as shown below.

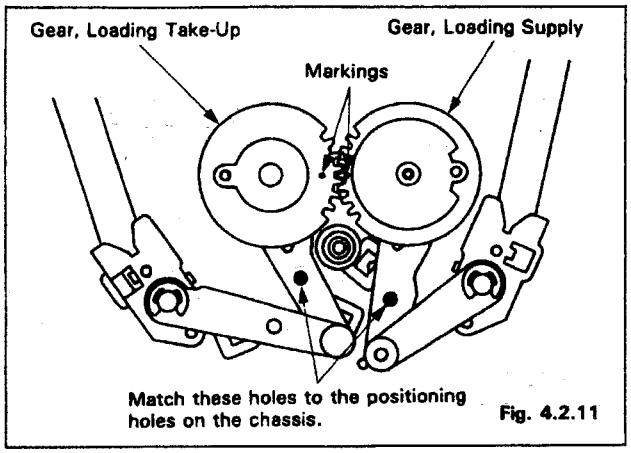


Fig. 4.2.11

2. Match the marks on the pinion gear to the mark on the master cam and the mode gear as shown below.

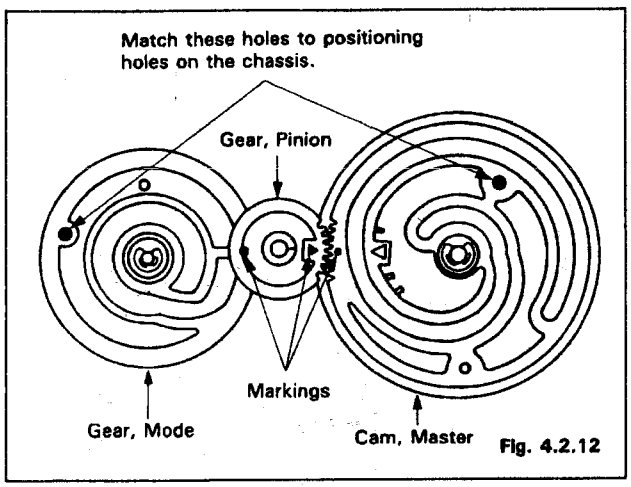


Fig. 4.2.12

3. Match the mark on the sector gear to the mark on the supply loading gear as shown below.

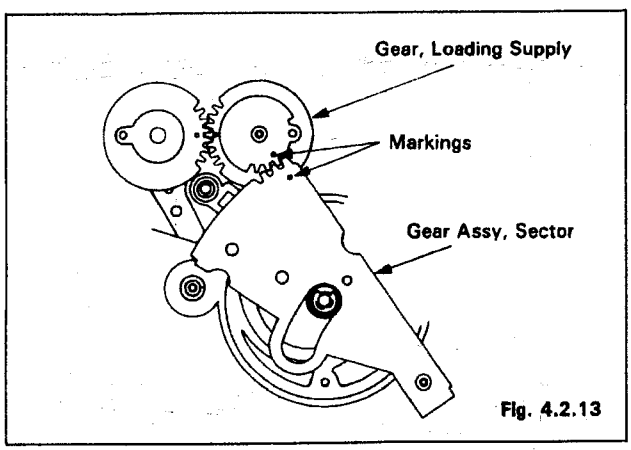


Fig. 4.2.13

4.2.9 LINK LOAD T COMPLETE / LINK LOAD S COMPLETE

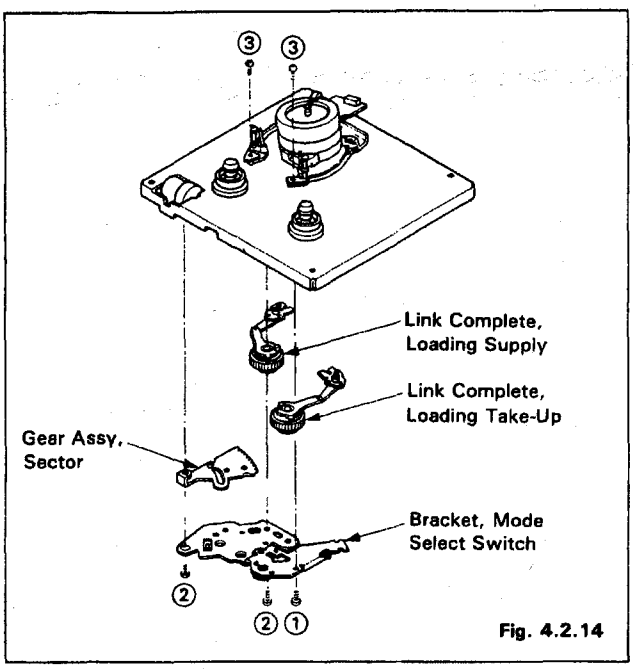


Fig. 4.2.14

4.2.10 CYLINDER

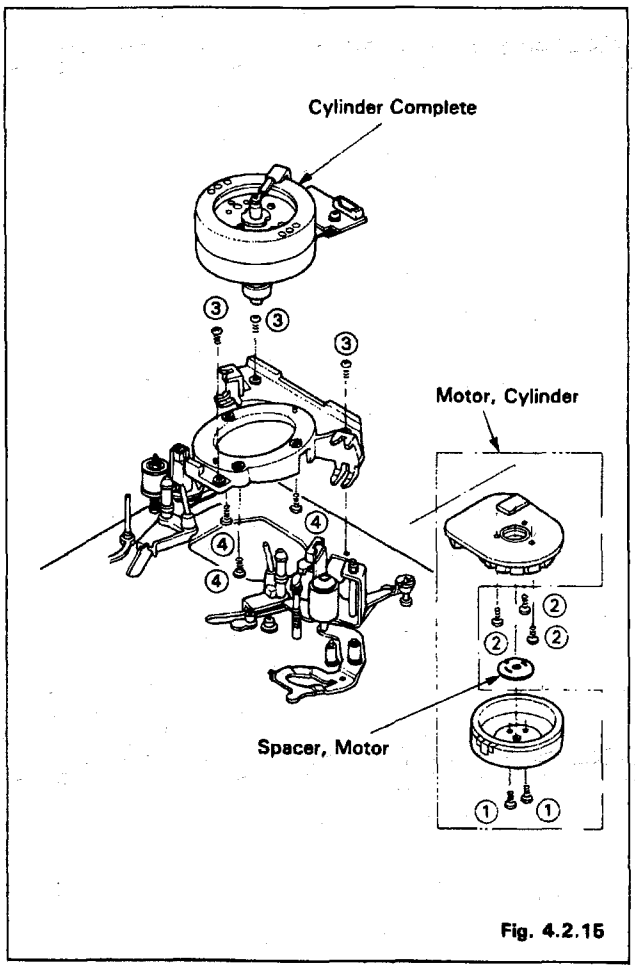


Fig. 4.2.15

4.2.11 UPPER CYLINDER

Prior to removing the upper cylinder, remove the soldered connection of the four lead wires inside the upper cylinder.

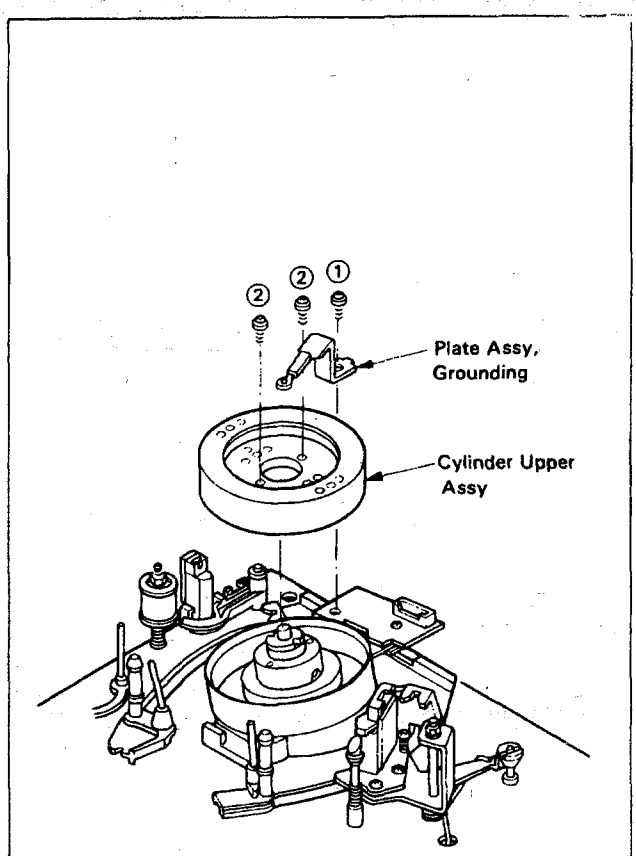


Fig. 4.2.16

Notes:

a) As the cylinder is a precision part, take care not to damage the heads or the tape transport area.

b) Hold the side of the upper cylinder (the tape transport area), and pull it upwards while turning it gradually to avoid excessive force. If the upper cylinder does not come off, it should be heated with a dryer to about 40°C before removal.

c) When installing the cylinder, tighten two screws ② uniformly to obtain a 5 kg-cm to 6 kg-cm torque value.

d) Prior to reassembling, clean up the contact surface on the upper cylinder with cleaning fluid. (Refer to Fig. 4.2.16)

e) After reassembling the cylinder, clean up the tape transport area with cleaning fluid and chamois. (Refer to Fig. 4.2.16)

4.2.12 MAIN BRAKE/SUB BRAKE

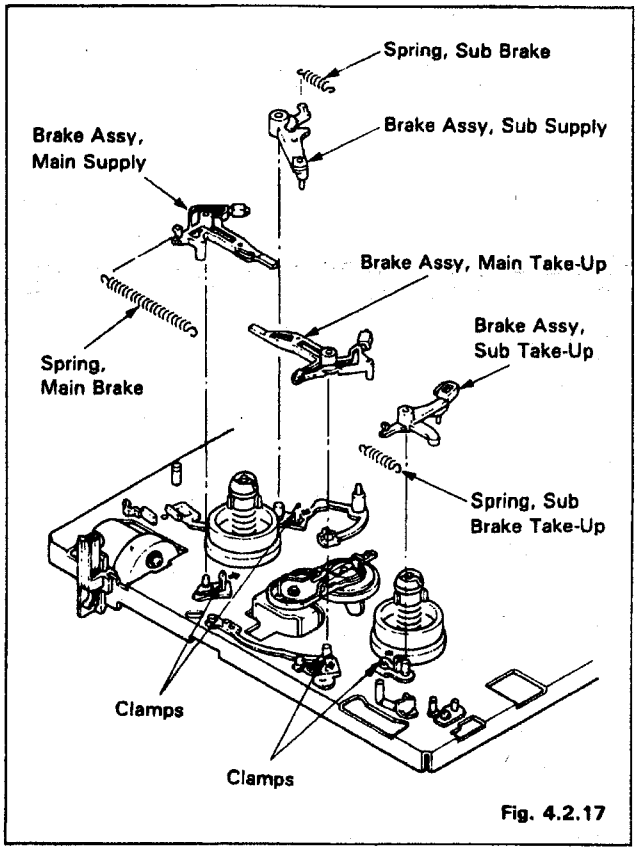


Fig. 4.2.17

4.2.13 PINCH ROLLER

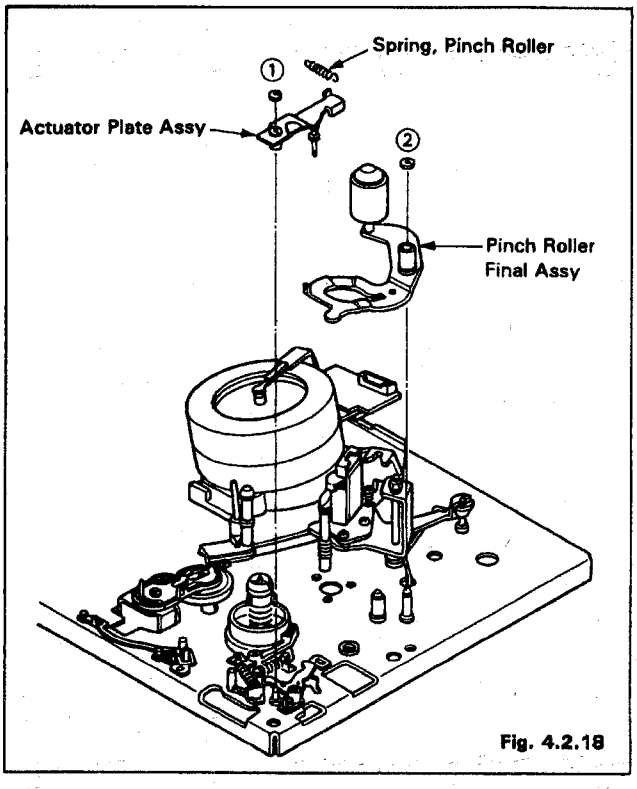


Fig. 4.2.18

4.2.14 TENSION ARM/BAND BRAKE

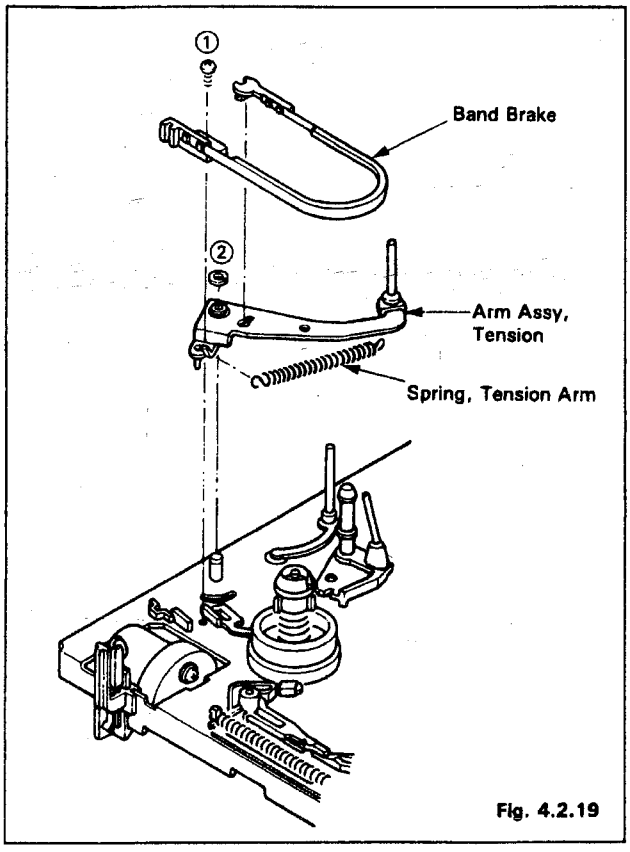


Fig. 4.2.19

4.2.15 END LED PC ASSY (FVH-P5100 only)

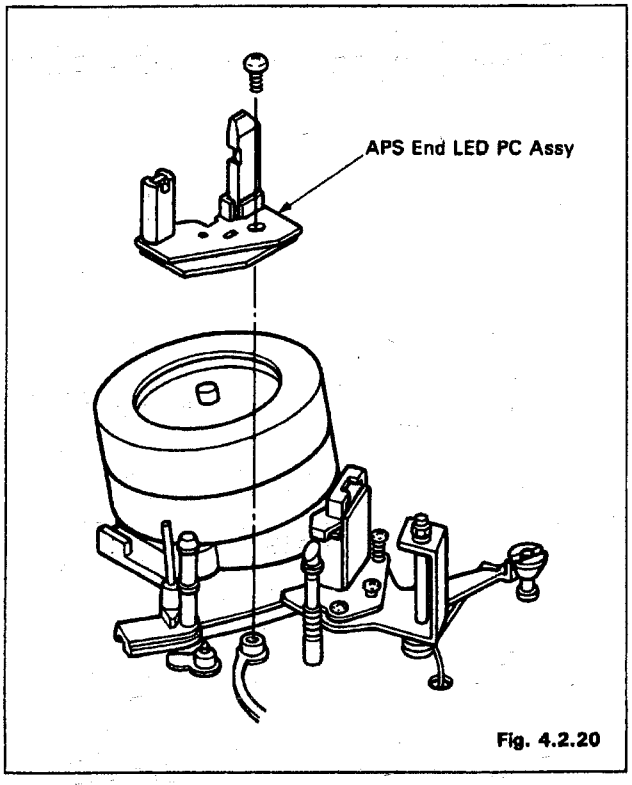


Fig. 4.2.20

4.2.16 FRONT LOADING MOTOR

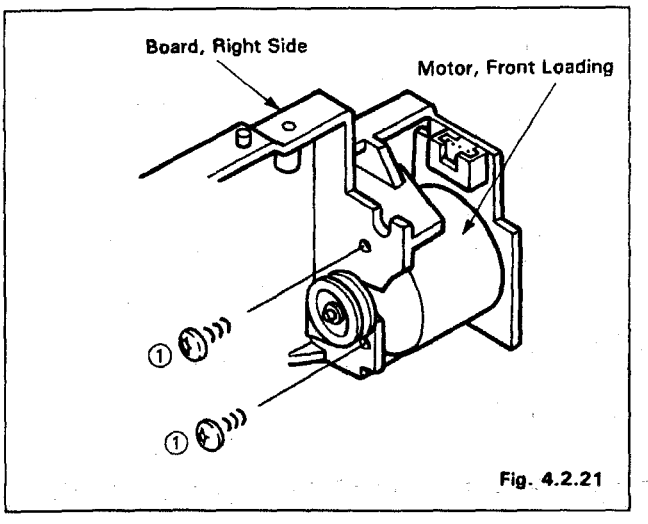


Fig. 4.2.21

4.2.17 START SWITCH/STOP SWITCH

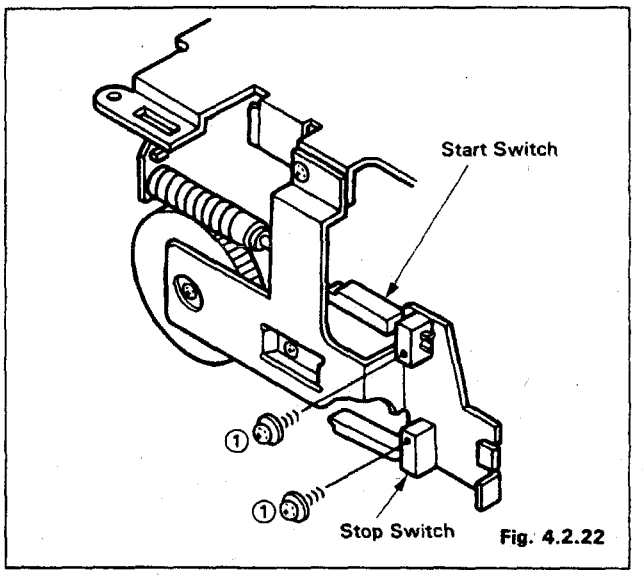


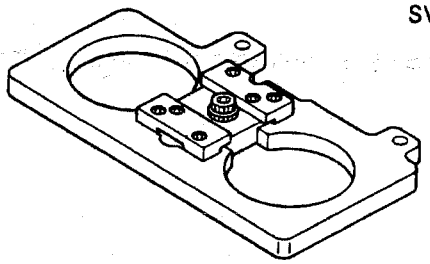
Fig. 4.2.22

5. MECHANICAL ADJUSTMENT

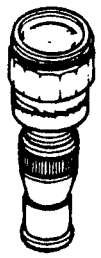
5.1 JIGS AND TOOLS FOR ADJUSTMENTS

No.	Part Name	Part No.	Remarks
1	Cassette Housing Positioning Jig	SVJ-00010	Reel height adjustment
2	Torque Meter (KT-300FF)	SVJ-00011	Rewind torque (Supply reel) Fast forward torque (Take-up reel)
3	Torque Meter (KT-300NV)	SVJ-00012	Back tension adjustment (Supply reel) Take-up torque (Take-up reel)
4	Torque Meter (KT-300RV)	SVJ-00052	Review torque (Supply reel) Review back tension (Take-up reel)
5	Torque Gauge	SVJ-00020	Main brake torque (Supply reel, Take-up reel) Fast forward back tension (Supply reel) Rewind back tension (Take-up reel)
6	Test Tape (VPM-6)	SVJ-00031	Monoscope, 6 kHz
7	Adjustment Driver	SVJ-00040	Guide roller height adjustment

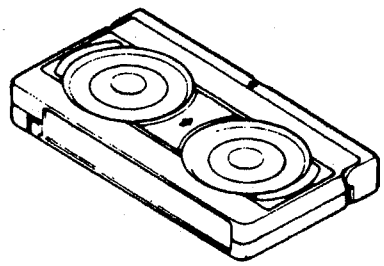
SVJ-00010



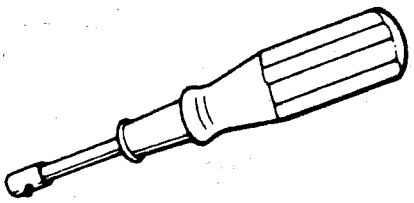
SVJ-00020



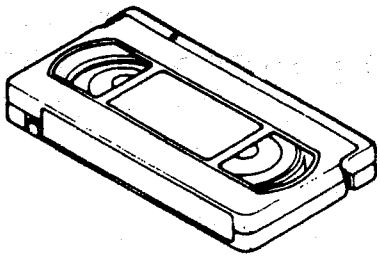
SVJ-00011
SVJ-00012
SVJ-00052



SVJ-00040



SVJ-00031



5.2 TAPE TRANSPORT ADJUSTMENT

5.2.1 REEL HEIGHT

1. Mount the cassette housing positioning jig and slide the gauge on the jig in the directions marked by the arrows.

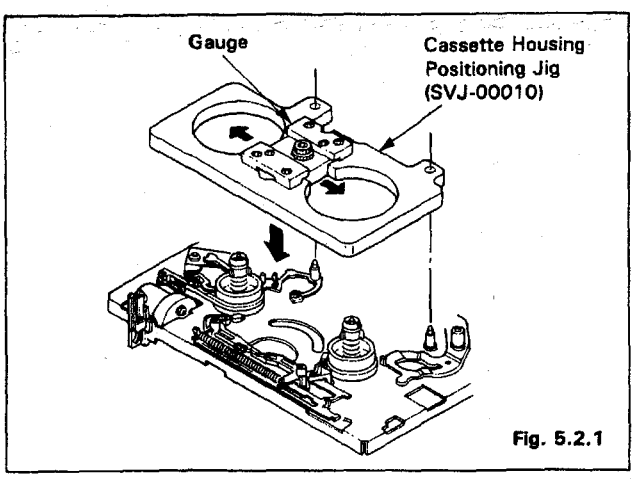


Fig. 5.2.1

2. The reel height is adjusted by changing the thickness of the POLYSLIDER washer.

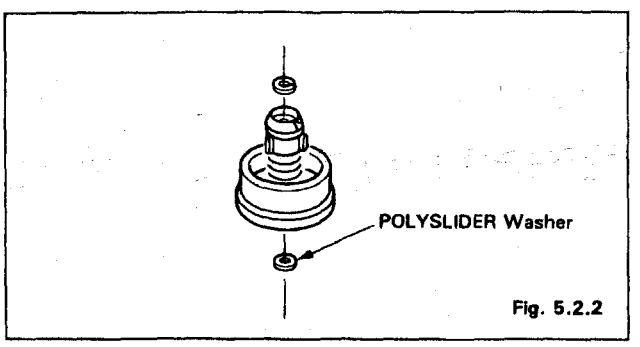


Fig. 5.2.2

3. Adjust the reel height so that the reel slides under surface A of the gauge but is stopped by surface B.
4. If the reel does not slide under surface A, change the washer thickness by using POLYSLIDER washer 0.5 mm or 0.3 mm. POLYSLIDER washer 0.4 mm is inserted at the factory.
5. Perform the same adjustment for the other reel.

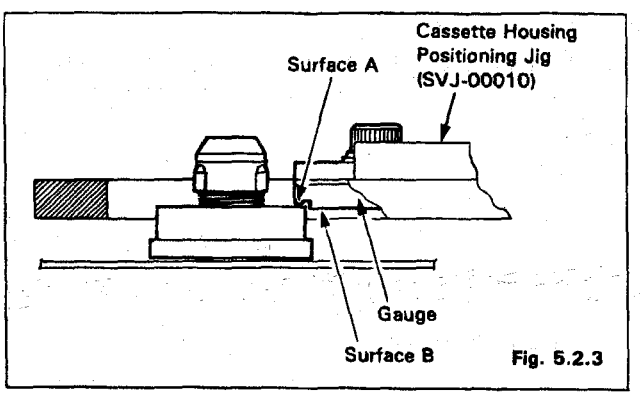


Fig. 5.2.3

5.2.2 BACK TENSION

1. Insert the torque meter (KT-300NV).
2. Set the VCR to the REC mode.
3. Measure the tension on the supply reel with a cassette-type torque meter (KT-300NV). The tension should be **50 gr-cm ± 5 gr-cm.**

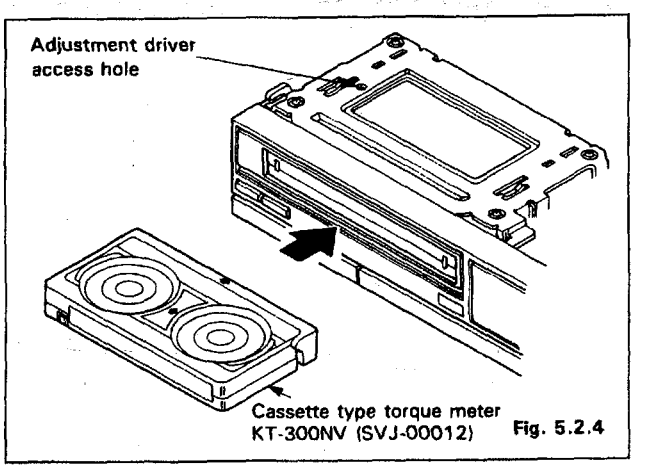


Fig. 5.2.4

4. If necessary, loosen the back tension adjustment screw, and adjust the position of the band brake to obtain the required tension value.
5. Retighten the screw when the required tension has been obtained.

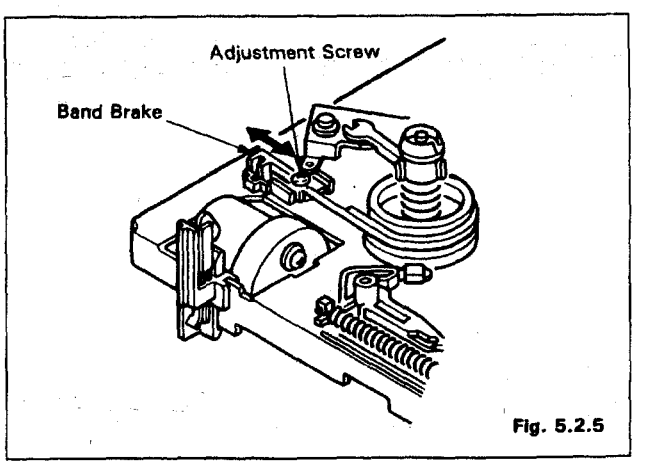


Fig. 5.2.5

Note:
The VCR should be placed horizontally for the back tension measuring procedure.

5.2.3 TAPE RUNNING POSITION ADJUSTMENT (GUIDE ROLLER/TAPE GUIDE)

1. Perform the height adjustment for the following items to obtain the proper tape running position.
   ① Tape Guide Roller
   ② Guide Roller (supply side)
   ③ Guide Roller (take-up side)
   ④ Tape Guide

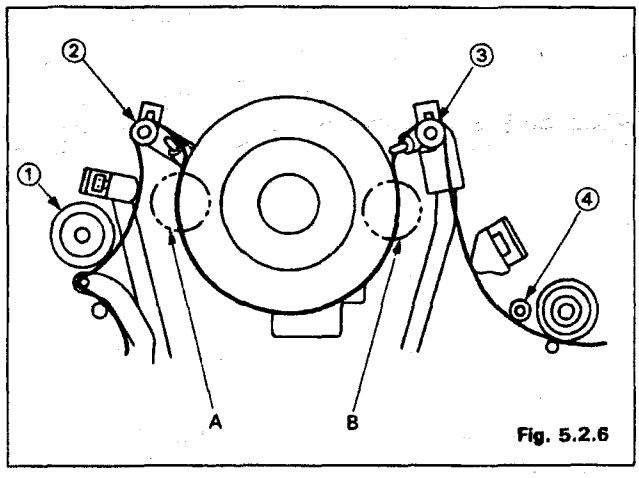


Fig. 5.2.6

2. Load a blank tape and set the VCR to the PLAY mode. Check the tape transport at points "A" and "B" as shown in Fig. 5.2.6.
3. Operate the VCR between the PLAY and STOP modes several times.
4. Observe the tape transport at the lead surface of the cylinder during the PLAY mode, and confirm that the tape runs smoothly along the lead surface of the cylinder without slipping downward and upward. (Refer to Fig. 5.2.7)

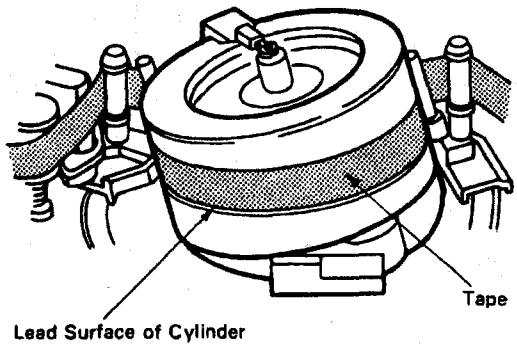


Fig. 5.2.7

5. During loading, play and unloading, observe the tape at the supply and take-up guide rollers, tape guide and tape guide roller. Confirm that there is no curling or creasing, etc., as shown in Fig. 5.2.8.

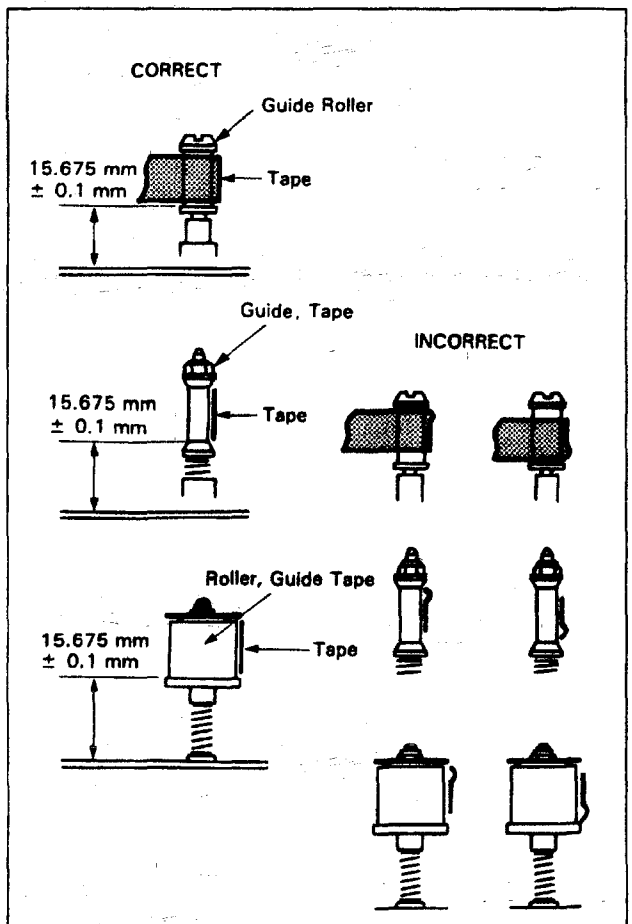


Fig. 5.2.8

6. If any curling or defects are noted, adjust tape guide roller and tape guide first. Adjust the height adjustment nut so that the tape runs as shown in Fig. 5.2.8. (Refer to Fig. 5.2.9)

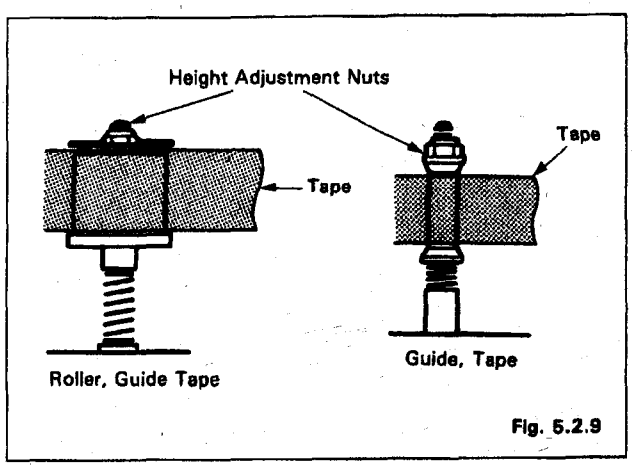


Fig. 5.2.9

7. Next, adjust the guide roller height. Insert the adjustment driver (SVJ-00040) into the guide roller top. (Refer to Fig. 5.2.10)
   Adjust the height by turning the driver slightly so that the tape runs on the guide roller as shown in Fig. 5.2.8, and the lower edge of the tape runs along the lead surface of the cylinder.

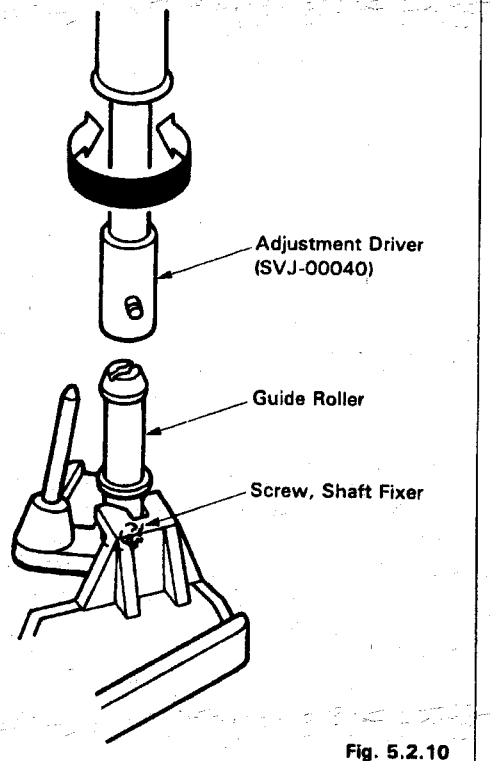


Fig. 5.2.10

8. After completion of tape guide roller and the supply side guide roller adjustments, adjust tape guide and the take-up side guide roller by using the same procedures as for the supply side adjustments. In this case, adjust the guide roller height first.
9. Finally, confirm that there is no curling or creasing at the take-up side guide roller and tape guide. If there is any curling or creasing between the take-up side guide roller and the audio control erase head, adjust the audio control erase head.

5.2.4 AUDIO CONTROL ERASE HEAD ADJUSTMENT

These adjustments should be carried out prior to the PLAY MODE TRACKING adjustment in Section 3.1.4 (2), and the X VALUE adjustment in Section 3.1.4 (3), the ACE HEAD HEIGHT/ACE HEAD TILT adjustment in Section 3.3.4 (1), and the ACE HEAD AZIMUTH adjustment in Section 3.3.4 (2).

1. Load a recorded tape and set the VCR to the PLAY mode.
2. Adjust the height of the edge of the audio track on the audio control erase head, using the height adjustment nut and the tilt adjustment screw, so that the tape transport is smooth at the tape guide. Align the audio control erase head height. (Refer to Fig. 5.2.11). Do not turn the tilt adjustment screw more than 90°.

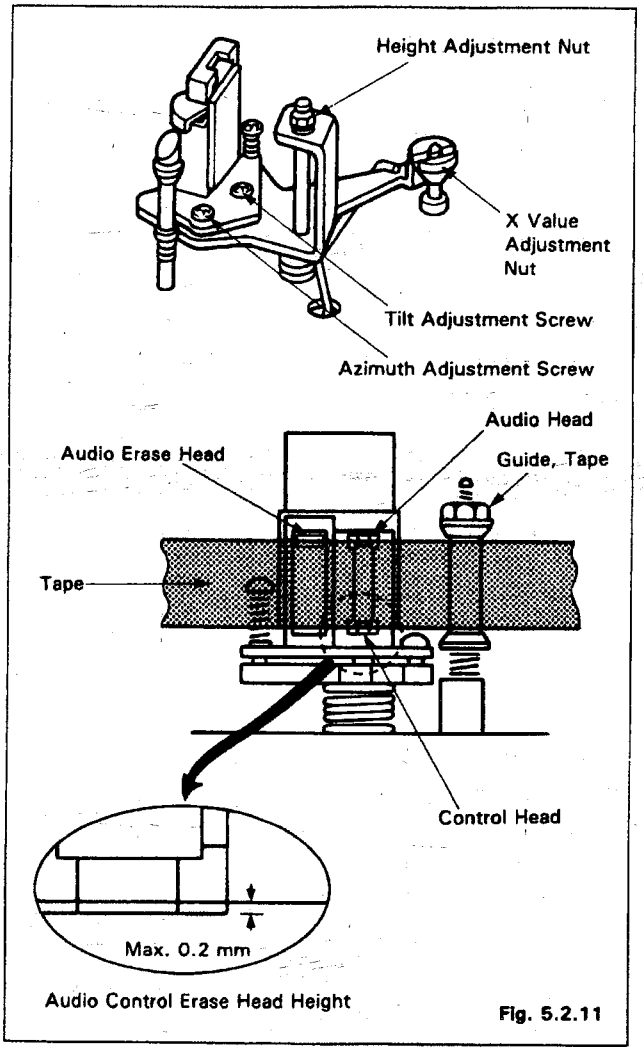


Fig. 5.2.11

3. The fine adjustment is not required at this time. The following conditions are sufficient:
   a) Proper tape transport between the audio control erase head and the tape guide.
   b) Stable SERVO system operation (proper pickup of the tape's recorded control signal).

5.2.5 PINCH ROLLER POSITION CHECKING

1. Set the VCR to the REC PAUSE mode.
2. Measure the clearance between the capstan and the pinch roller. It should be **from 0.5 mm to 1.5 mm.**

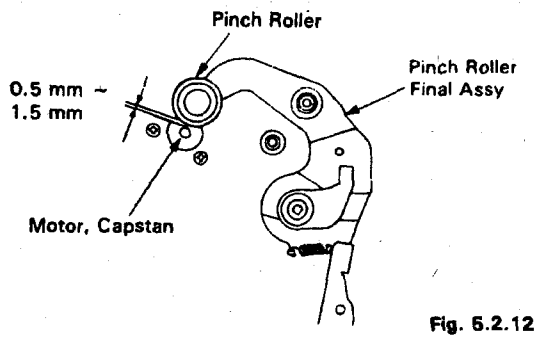


Fig. 5.2.12

3. If the clearance is out of tolerance, replace the appropriate parts (Pinch Roller F Assy, Cam Actuator, etc.).

5.2.6 TORQUE VALUE CHECKING

Measuring Mode	Torque	Measuring reel	Torque Value	Measuring Equipment
PLAYBACK	Back Tension	Supply	45 gr-cm to 55 gr-cm *1	KT-300NV
	Take-up Torque	Take-up	100 gr-cm to 200 gr-cm	KT-300NV
REVIEW	Rewind Torque	Supply	140 gr-cm to 200 gr-cm	KT-300RV
	Back Tension	Take-up	40 gr-cm to 65 gr-cm	KT-300RV
FAST FORWARD *3	Back Tension	Supply	15 gr-cm to 30 gr-cm	Torque Gauge
	Take-up Torque	Take-up	800 gr-cm or more	KT-300FF
REWIND *3	Rewind Torque	Supply	800 gr-cm or more	KT-300FF
	Back Tension	Take-up	15 gr-cm to 30 gr-cm	Torque Gauge
STOP	Brake Torque	Supply	150 gr-cm or more *2	Torque Gauge
	Brake Torque	Take-up	150 gr-cm or more *2	Torque Gauge

*1 The adjustment value at Section 5.2.2.
*2 Check this value before the reel starts to rotate.
*3 Cover the tape end sensor on the supply reel side with black insulating tape etc., so that the mechanism will operate without inserting a cassette.

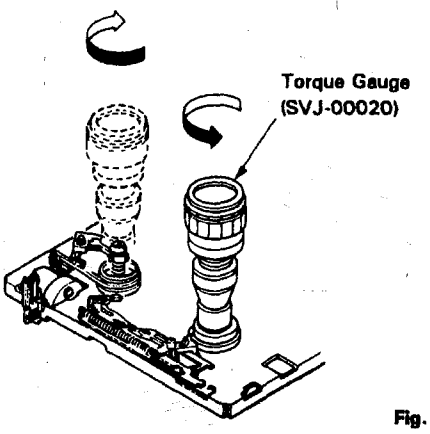
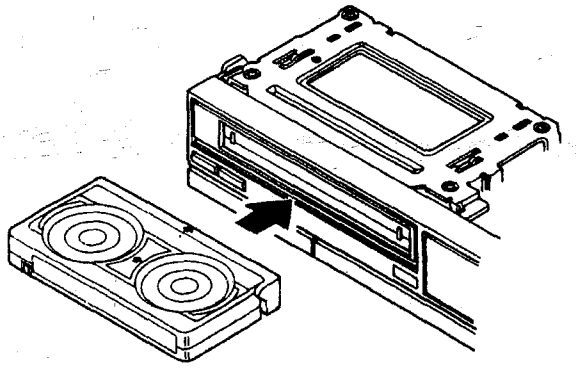


Fig. 5.2.13



Cassette type torque meter KT-300FF/KT-300NV/KT-300RV (SVJ-00011/SVJ-00012/SVJ-00052) Fig. 5.2.14

If the torque value checked is out of tolerance, replace the appropriate parts as follows:

Check Items	Replace Parts
PLAY BACK Back Tension	Refer to Section 5.2.2
PLAY BACK Take-up Torque	Idler, Complete or Belt Drive or Clutch, Complete
REVIEW Rewind Torque	Idler, Complete or Belt Drive or Clutch, Complete
REVIEW Back Tension	Sub Brake Take-up
FAST FORWARD Back Tension	Band Brake
FAST FORWARD Take-up Torque	Idler, Complete or Belt Drive
REWIND Rewind Torque	Idler, Complete or Belt Drive
REWIND Back Tension	Sub Brake Take-up
Brake Torque Supply	Main Brake Supply
Brake Torque Take-up	Main Brake Take-up

5.3 ENVELOPE ADJUSTMENT

1. This adjustment should be made after making the tape transport adjustments.
2. When exchanging a circuit board, or parts on a circuit board, perform Section 3 (ELECTRICAL ADJUSTMENT).

5.3.1 ENVELOPE WAVEFORM SHAPING

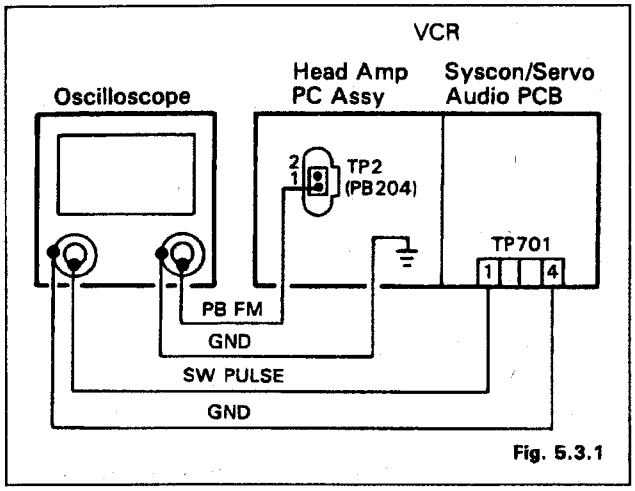


Fig. 5.3.1

Measuring Point	Measuring Equipment	ADJ. Condition
Pin 1 of TP2 (PB204) (on Head Amp PC Assy) Pin 1 of TP701 (SW PULSE) Pin 4 of TP701 (GND)	Oscilloscope	PLAY mode Test tape (VPM-6)

ADJ. Location	ADJ. Value
Guide Rollers Tape Guide	Maximum level and correct waveform (PB FM Signal)

1. Rotate VR151 (TRACKING control knob) behind the door on the front panel, and check with the oscilloscope that the PB FM Signal is brought to its maximum level. Then set VR151 (TRACKING control knob) behind the door on the front panel to its centre (detent) position and confirm that a nearly maximum level is obtained.

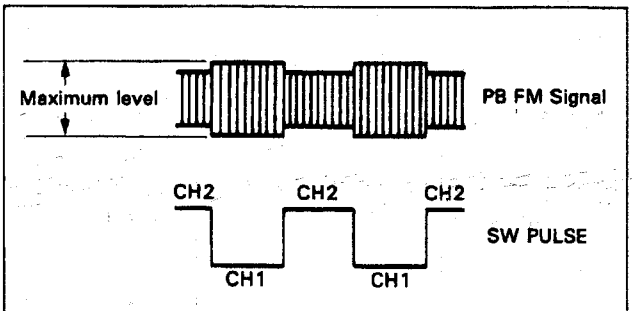


Fig. 5.3.2

2. The envelope adjustment can be performed by adjusting the height of both the supply side and the take-up side guide rollers.
3. The starting portion of the waveform can be adjusted by adjusting the supply side guide roller height. (Refer to Fig. 5.3.3)

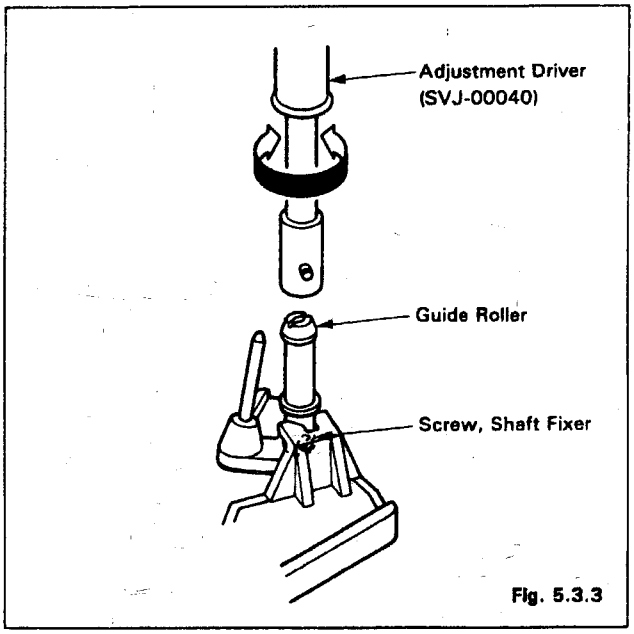


Fig. 5.3.3

4. Adjust the supply side guide roller height so that a flat continuous large waveform is obtained as shown in Fig. 5.3.4

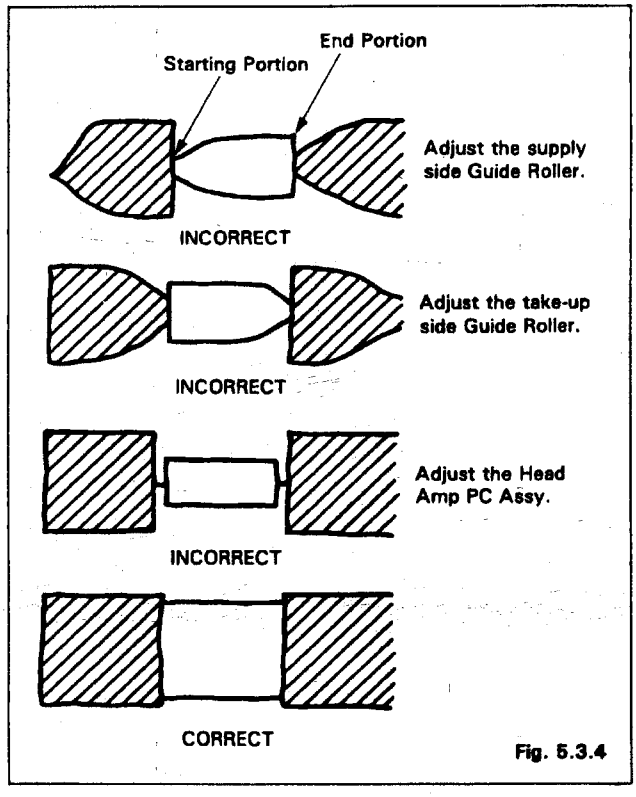


Fig. 5.3.4

5. Adjust the end portion of the waveform by adjusting the take-up side guide roller height, so that the waveform as shown in Fig. 5.3.3 is obtained.
6. After adjustment, rotate VR151 (TRACKING control knob) behind the door on the front panel to the left and right, and check that the waveform changes symmetrically.
7. Check the tape curl, refering to Section 5.2.3 (TAPE RUNNING POSITION ADJUSTMENT).

Note:
After the adjustment of Section 5.3.1 ENVELOPE WAVEFORM SHAPING, check the items described in the following table. If necessary, readjust them.

1	CH1 PHASE/CH2 PHASE	Refer to Section 3.1.4 (1)
2	ACE HEAD HEIGHT/ ACE HEAD TILT	Refer to Section 3.3.4 (1)
3	AZIMUTH	Refer to Section 3.3.4 (2)
4	X VALUE	Refer to Section 3.1.4 (3)

5.4 TAPE TRANSPORT ADJUSTMENT

It is very important for a VCR that the tape runs without creasing or curling, from the tape outlet of the video cassette to the tape inlet of the cassette.
The tape transport adjustment must be performed when the parts shown in Fig. 5.4 are removed and refitted. When adjustment is required, perform it in accordance with the sequence given in the chart below.

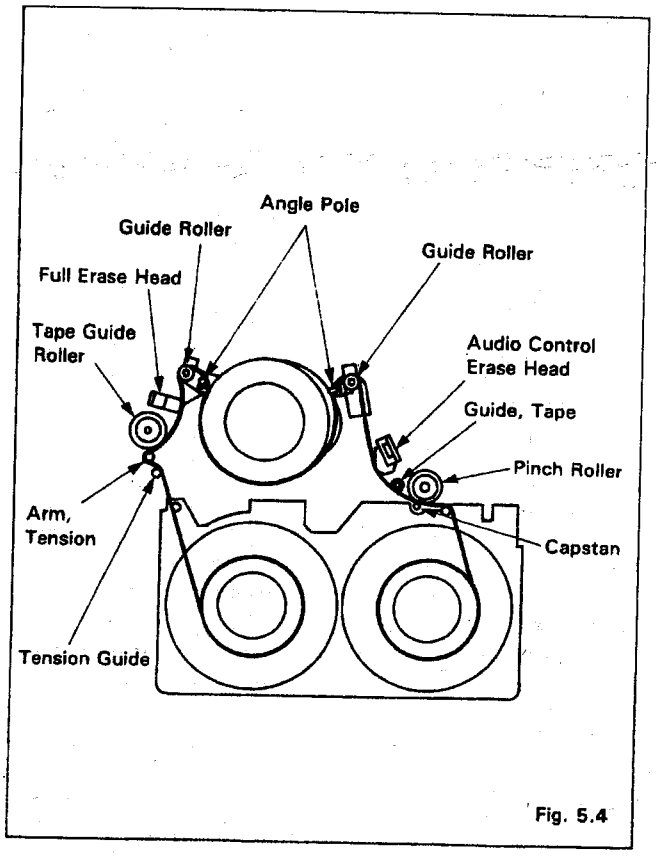
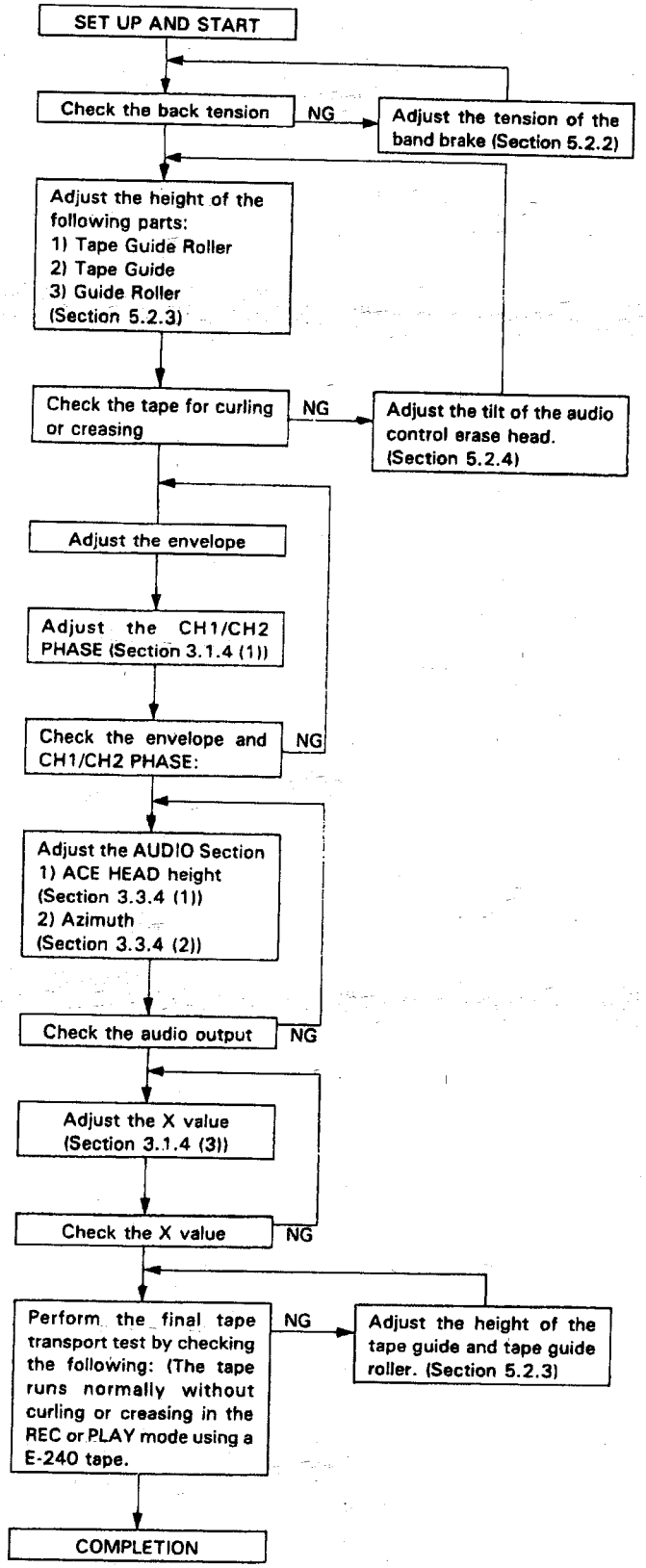


Fig. 5.4


SET UP AND START
Check the back tension
NG
Adjust the tension of the band brake (Section 5.2.2)
Adjust the height of the following parts:
1) Tape Guide Roller
2) Tape Guide
3) Guide Roller
(Section 5.2.3)
Check the tape for curling or creasing
NG
Adjust the tilt of the audio control erase head. (Section 5.2.4)
Adjust the envelope
Adjust the CH1/CH2 PHASE (Section 3.1.4 (1))
Check the envelope and CH1/CH2 PHASE:
NG
Adjust the AUDIO Section
1) ACE HEAD height
(Section 3.3.4 (1))
2) Azimuth
(Section 3.3.4 (2))
Check the audio output
NG
Adjust the X value
(Section 3.1.4 (3))
Check the X value
NG
Perform the final tape transport test by checking the following: (The tape runs normally without curling or creasing in the REC or PLAY mode using a E-240 tape.
NG
Adjust the height of the tape guide and tape guide roller. (Section 5.2.3)
COMPLETION

6. MAINTENANCE

6.1 MAINTENANCE PARTS AND PERIODS

In order to keep the VCR in peak working orde:, maintain the parts indicated in Table 6.1 at the periods given.

Parts \ Hours	500	1000	1500	2000	2500	3000	3500	4000	4500	5000
CYLINDER	○	○	○	○	○	○	○	○	○	○
AUDIO CONTROL ERASE HEAD	○	○	○	○	○	○	○	○	○	○
FULL ERASE HEAD	○	○	○	○	○	○	○	○	○	○
CAPSTAN	○	○	○	○	○	○	○	○	○	○
IDLER COMPLETE	○	○	○	●	○	○	○	●	○	○
PINCH ROLLER	○	○	○	○	○	●	○	○	○	○
BELT, DRIVE	○	○	○	●	○	○	○	●	○	⊙
PAD, MAIN BRAKE				●				●		
CLUTCH COMPLETE (FRICTION ASSY)				●				●		
REEL, TAKE-UP				○				○		
REEL, SUPPLY				○				○		

Table 6.1

○: Cleaning . . . Freon (fluorine-based organic solvent) Absolute methyl alcohol

●: Replacement

Above replacement times will vary greatly according to environmental and usage conditions. Routine inspection and maintenance are also important factors that influence the unit life. Note that rubber parts may become aged or deformed after long periods of storage, even if the unit is not used.

Note:
Even if the unit is not used frequently, cleaning and replacement of the rubber parts should be undertaken every 2 years.

6.2 CLEANING

6.2.1 CYLINDER

Wrap a piece of chamois around your finger. Dip it in head-cleaning fluid and clean the cylinder head. Move the chamois horizontally several times (in the direction of the arrow). Another cylinder head is located 180° away on the opposite side. Clean it the same way.
In the same manner clean the tape transport area of the cylinder. (Refer to Fig. 6.2.1)

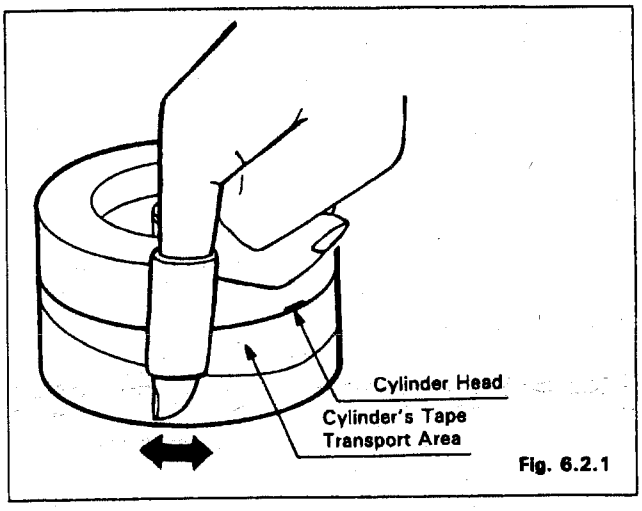


Fig. 6.2.1

Note: Do not push forcefully against the cylinder head. Do not move the chamois up or down since this may damage the head. Always use a piece of chamois for cleaning.

6.2.2 AUDIO CONTROL ERASE HEAD

Wrap a piece of chamois around your finger. Dip it in head-cleaning fluid and clean the audio control erase head, wiping it horizontally.
Clean the FULL ERASE HEAD, the CAPSTAN MOTOR and the PINCH ROLLER in the same manner. (Refer to Fig. 6.2.2)

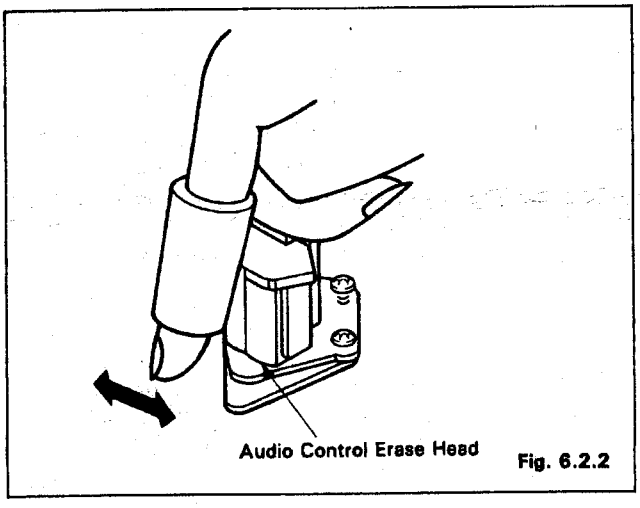


Fig. 6.2.2

6.3 LUBRICATION

6.3.1 LUBRICATING PARTS

The following parts should be lubricated with oil (Turbionol No. 64 or equivalent) every 2000 hours.
(1) Supply reel
(2) Take-up reel

6.3.2 LUBRICATING PROCEDURE

1. Detach both of the reel stopper washers. (Refer to Fig. 6.3.1 ①)
2. Remove the supply and take-up reels.
3. Apply oil to the top at the axes.
4. Replace the supply reel and take-up reel, then replace the reel stopper washers.

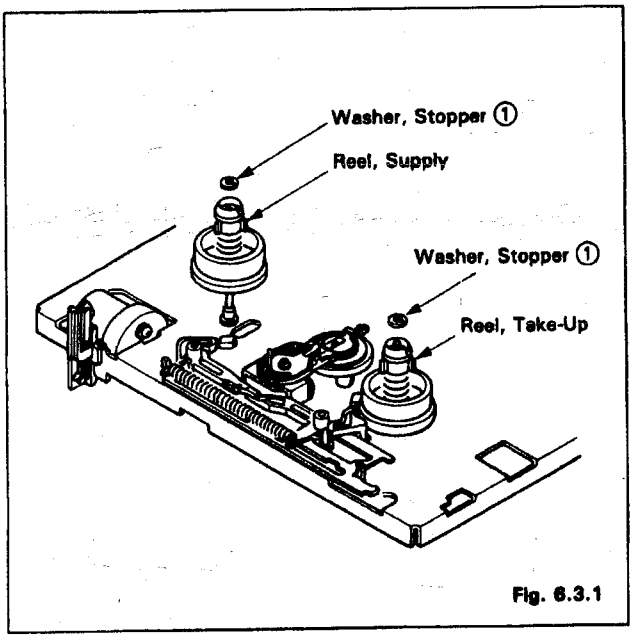


Fig. 6.3.1

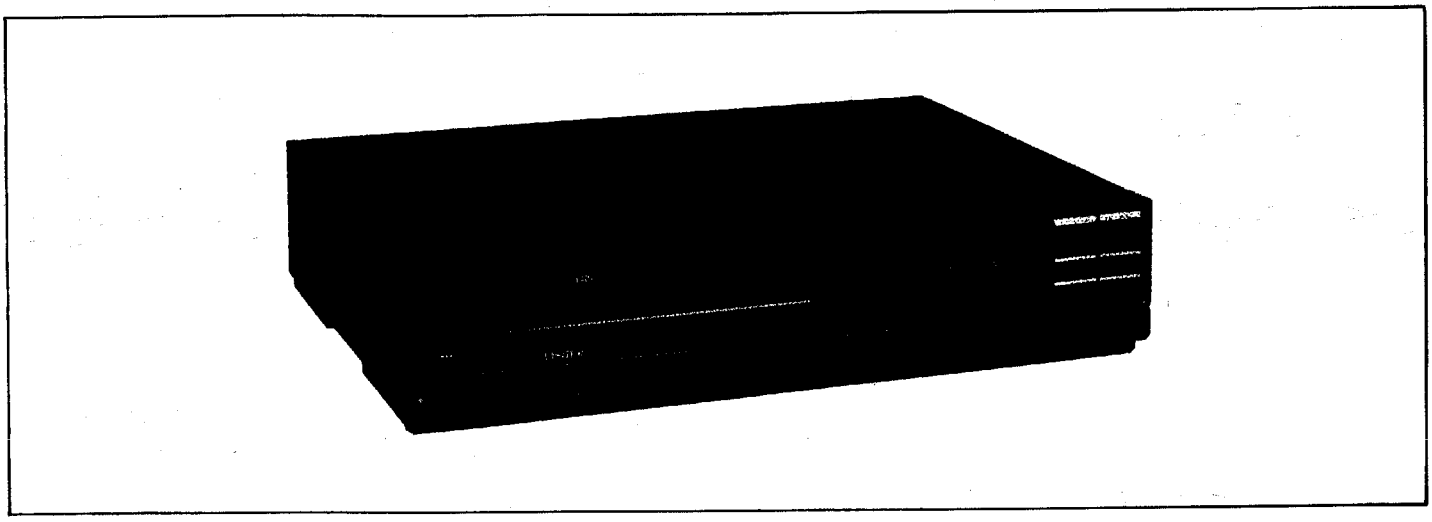
PARTS LIST & SCHEMATIC DIAGRAMS

FISHER®

FVH-P5100

(U. K.)

VIDEO CASSETTE RECORDER



TECHNICAL SPECIFICATIONS

General Specifications	
Television system	CCIR: 625 lines, 50 fields, PAL standard colour and monochrome signals
Recording system	Rotary helical scan system with two video heads one stationary head for normal track monaural sound
Format	VHS PAL standard
Tape width	12.7 mm
Tape speed	23.39 mm/sec
Recording time	240 minutes with E-240 cassette
Tape loading system	Automatic loading
Tuner	Voltage Synthesizer tuner with sequential channel selection Channel +/− selection with remote control 30 programs memories
Tuner channels	UHF: #21−#69 (470MHz−862MHz)
RF converter output	UHF channel 37 (30−39 adjustable)
Time indication	AM/PM 12-hour display system
Timer	14-day 4 programs
Tape counter	Separate 4-digit electronic display
Auto function	Power On/Playback/Rewind/Eject/Power Off/ Cancel

Terminals	
Aerial input	DIN (socket)
RF output	DIN (plug)
Video input/output	RCA connector
Audio input/output	RCA connector
Electrical Specifications	
Video output	1 volt (pp) / 75Ω
Video input	0.5−2.0 volt (pp) / 75Ω
Audio output	400 mV (−8 dBV) 600Ω
Audio input	400 mV (−8 dBV) 50kΩ
Video S/N ratio	More than 40 dB (45 dB)
Audio frequency response	50−10.000 Hz (normal sound)
Audio S/N ratio	More than 40 dB (42 dB)
Other Specifications	
Power requirement	240VAC, 50Hz
Power consumption	24 Watts
Dimensions (W×H×D)	440mm × 99mm × 335mm
Weight(approximate)	6.8Kg

Because its products are subject to continuous improvement, FISHER CORPORATION reserves the right to modify product designs and specifications without notice and without incurring any obligation.

REFERENCE NO. WM-20605

This is a Parts list & Schematic Diagrams for Model FVH-P5100 and only items changed from Model FVH-P5000 are indicated. For other items, refer to Parts List & Schematic Diagrams for Model FVH-P5000 **(WM-20205)** Issued Mar. '87.

ACCESSORIES

FVH-P5000			FVH-P5100		
Ref No	Part No	Description	Part No	Description	Remarks
	143-6-2704-58700	FAN BAG ASSY (Plastic Bag)	143-6-2704-58700	FAN BAG ASSY (Plastic Bag)	Change
	4-1924-01640	WIRELESS REMOTE CONTROL RVR-510E	4-1924-01840	WIRELESS REMOTE CONTROL RVR-530E	Change
	143-6-2704-62800	FAN BAG ASSY (Plastic Bag)	143-6-2704-63000	FAN BAG ASSY (Plastic Bag)	Change
	143-6-4114-39000	INSTRUCTION MANUAL	143-6-4114-39100	INSTRUCTION MANUAL	Change

WIRELESS REMOTE CONTROL UNIT

Ref No	Part No	Description	Part No	Description	Remarks
	4-1924-01640	Wireless Remote Control RVR-510E	4-1924-01840	Wireless Remote Control RVR-530E	Change
1	143-0-9964-12101	Case, Upper Assy-RC	143-0-9964-12801	Case, Upper Assy-RC	Change
3	143-0-9964-12101	4 Button-RC	143-0-9964-12802	6 Button-RC	Change

PACKING MATERIALS

Ref No	Part No	Description	Part No	Description	Remarks
	143-6-1424-02518	IND. CORR CARTON-UKP5000	143-6-1424-02519	IND. CORR CARTON-UKP5100	Change

CABINET PARTS (1)

Ref No	Part No	Description	Part No	Description	Remarks
1	143-0-1254-00806	Top Cover Assy-HBK-H	143-0-1254-00807	Top Cover Assy-HBK-J	Change
3	0-4014-06075	Front Right PC Assy	0-4014-06076	Front Right PC Assy	Change
5	143-0-1104-02609	Cabinet Front Assy-HBM-M	143-0-1104-02610	Cabinet Front Assy-HBM-P	Change

CABINET PARTS (2)

Ref No	Part No	Description	Part No	Description	Remarks
1	143-0-7304-10202	Stage, Complete-H	143-0-7304-10203	Stage, Complete-H	Change
18	0-4014-06610	Syscon Servo/Audio PC Assy	0-4014-06611	Syscon Servo/Audio PC Assy	Change
25	0-4014-06760	Video/Voltage Synthesizer PC Assy	0-4014-06761	Video/Voltage Synthesizer PC Assy	Change
31	143-0-1304-01415	Cabinet Bottom Assy-HBQ-W	143-0-1304-01416	Cabinet Bottom Assy-HBQ-Y	Change

CHASSIS PARTS (1)

Ref No	Part No.	Description	Part No	Description	Remarks
1	143-2-7304-23802	Flap-HBK-A2	143-2-7304-23803	Flap-HBK-A3	Change

CHASSIS PARTS (3)

Ref No	Part No.	Description	Part No.	Description	Remarks
9	143-0-5104-03900	Link, Loading Take-Up Complete	143-0-5104-03900 143-0-5104-07000	Link, Loading Take-Up Complete] or Link, Loading Take-Up Complete]	Alternate
10	143-0-5104-03700	Link, Loading Supply Complete	143-0-5104-03700 143-0-5104-06900	Link, Loading Supply Complete] or Link, Loading Supply Complete]	Alternate

VIDEO/VOLTAGE SYNTHESIZER P.C.B. PARTS

FVH-P5000			FVH-P5100			
Schematic Location	Part No.	Description	Part No.	Description		Remarks
	0-4014-06760	VIDEO/VOLTAGE SYNTHESIZER PC ASSY	0-4014-06761	VIDEO/VOLTAGE SYNTHESIZER PC ASSY		Change
	0-4010-00131	VIDEO ASSY	0-4010-00401	VIDEO ASSY		Change
		(CAPACITORS)				
C2153	403 038 6301	ELECT 220U M 6.3V				Delete
C2171			403 023 9607	CERAMIC 39P J 50V		Add
C2172			403 014 0200	CERAMIC 18P J 50V		Add
C2173			403 039 6508	ELECT 100U M 10V		Add
C2174			403 038 1603	ELECT 100U M 6.3V		Add
C2175			403 002 0502	CERAMIC 1000P K 25V		Add
C2176			403 002 0502	CERAMIC 1000P K 25V		Add
C2177			403 014 0200	CERAMIC 18P J 50V		Add
C2178			4-2224-00070	TRIMMER CON 30P		Add
C2179			403 072 2703	CERAMIC 0.022U Z 50V		Add
C2182			403 008 5105	CERAMIC 10P D 50V		Add
C2183			403 041 8804	ELECT 10U M 16V		Add
		(DIODES)				
D213	407 012 4406	DIODE 1SS133				Delete
or	407 008 0207	DIODE GMA01L				
or	407 008 6704	DIODE MA165. SAN				
D214	407 012 4406	DIODE 1SS133				Delete
or	407 008 0207	DIODE GMA01L				
or	407 008 6704	DIODE MA165. SAN				
D215			407 012 4406	DIODE 1SS133		Add
or			407 008 0207	DIODE GMA01L		
or			407 008 6704	DIODE MA165. SAN		
D219			407 012 4406	DIODE 1SS133		Add
or			407 008 0207	DIODE GMA01L		
or			407 008 6704	DIODE MA165. SAN		
		(IC)				
IC205			410 029 7001	IC M50455-001SP		Add
		(PLUGS)				
L2172			4-2724-U150K	INDUCTOR 15UH		Add
L2173			4-2724-U101K	INDUCTOR 100UH		Add
		(TRANSISTORS)				
Q271			405 004 4502	TR 2SA608-F-NP-AA		Add
or			405 004 5004	TR 2SA608-G-NP-AA		
		(RESISTORS)				
R2171			401 021 1807	CARBON 560	JA 1/4W	Add
R2173			401 023 1607	CARBON 820	JA 1/4W	Add
R2174			401 023 1607	CARBON 820	JA 1/4W	Add
R2175			401 012 5609	CARBON 1K	JA 1/4W	Add
R2176			401 016 3700	CARBON 2.2K	JA 1/4W	Add
R2177			401 018 3708	CARBON 3.3K	JA 1/4W	Add
R2178			401 017 1705	CARBON 2.7K	JA 1/4W	Add
R2179			401 021 2903	CARBON 5.6K	JA 1/4W	Add
R2181			401 018 3708	CARBON 3.3K	JA 1/4W	Add
R2182			401 019 0904	CARBON 390	JA 1/4W	Add
R2183			401 020 1907	CARBON 4.7K	JA 1/4W	Add
R2184			401 014 4006	CARBON 1.5K	JA 1/4W	Add
R2185			401 022 1806	CARBON 680	JA 1/4W	Add
R2186			401 012 5609	CARBON 1K	JA 1/4W	Add
R2187			401 012 5609	CARBON 1K	JA 1/4W	Add

FVH-P5000			FVH-P5100		
Schematic Location	Part No.	Description	Part No.	Description	Remarks
R2188			401 012 5609	CARBON 1K JA 1/4W	Add
R2189			401 012 5609	CARBON 1K JA 1/4W	Add
R2191			401 020 1907	CARBON 4.7K JA 1/4W	Add
R2192			401 020 1907	CARBON 4.7K JA 1/4W	Add
R2193			401 020 1907	CARBON 4.7K JA 1/4W	Add
X202			4-2254-00220	CRYSTAL 17.734475MHz	Add
or			4-2254-00221	CRYSTAL 17.734475MHz	
	0-4010-00142	VOLTAGE SYNTHESIZER ASSY	0-4010-00145	VOLTAGE SYNTHESIZER ASSY	Change
		(DIODES)			
D1011	407 012 4208	DIODE 1SS131			Delete
or	407 007 9904	DIODE GMA01			

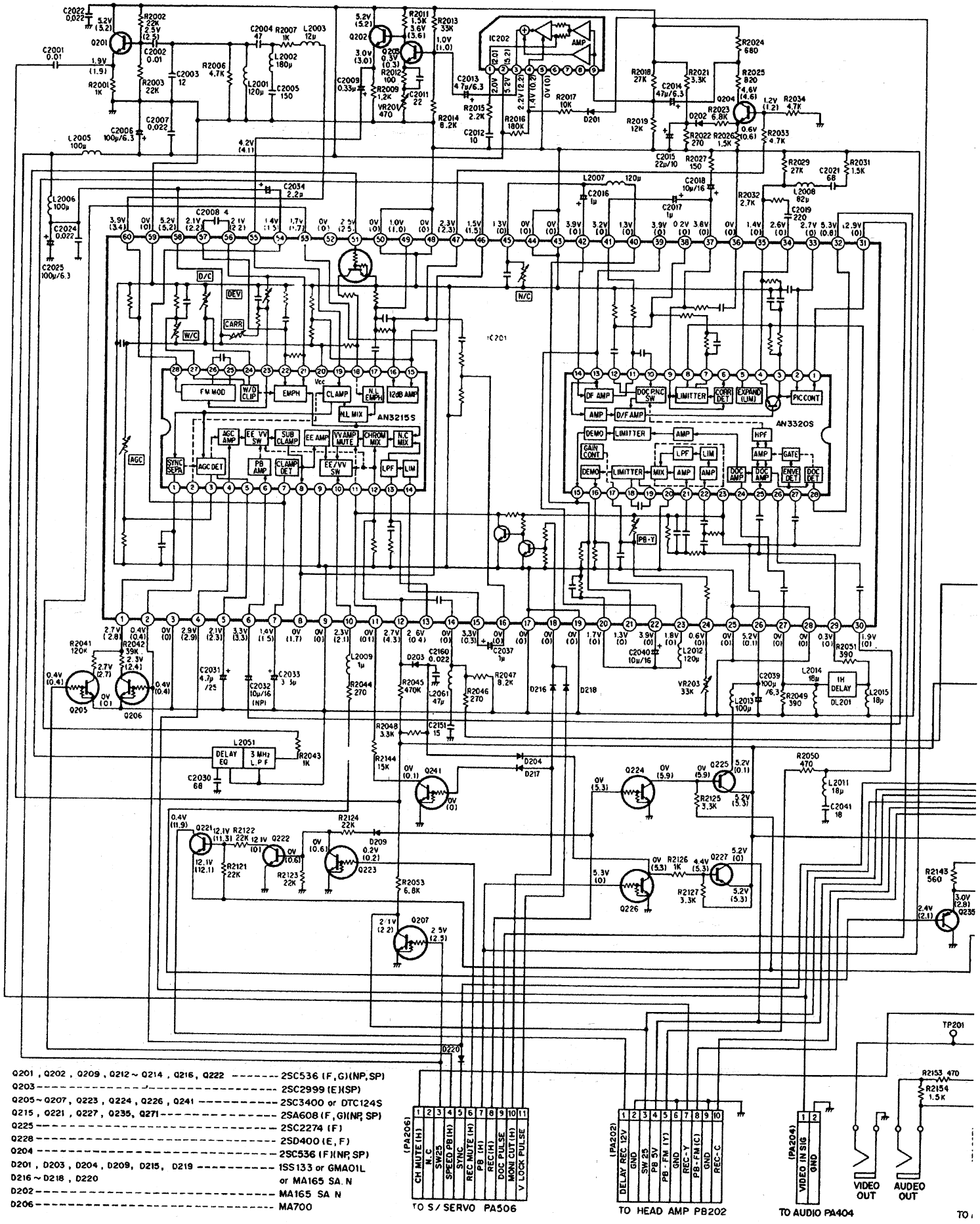
SYSTEM CONTROL SERVO/AUDIO P.C.B. PARTS

Schematic Location	Part No.	Description	Part No.	Description	Remarks
	0-4014-06610	SYSCON/AUDIO PC ASSY	0-4014-06611	SYSCON/AUDIO PC ASSY	Change
	0-4010-00380	SYSCON SERVO ASSY	0-4010-00381	SYSCON SERVO ASSY	Change
		(CAPACITOR)			
C7038			403 061 8204	POLYESTER 4700P K 50V	Add
		(RESISTORS)			
R5008			401 016 4707	CARBON 22K JA 1/4W	Add
R7057			401 020 1907	CARBON 4.7K JA 1/4W	Add
R7059	401 018 4804	CARBON 33K JA 1/4W	401 020 2805	CARBON 47K JA 1/4W	Change
R7061	401 018 4804	CARBON 33K JA 1/4W	401 020 2805	CARBON 47K JA 1/4W	Change
		(VARIABLE RESISTOR)			
VR707			4-2224-01210	SEMI 68kB	Add

FRONT RIGHT P.C.B. PARTS

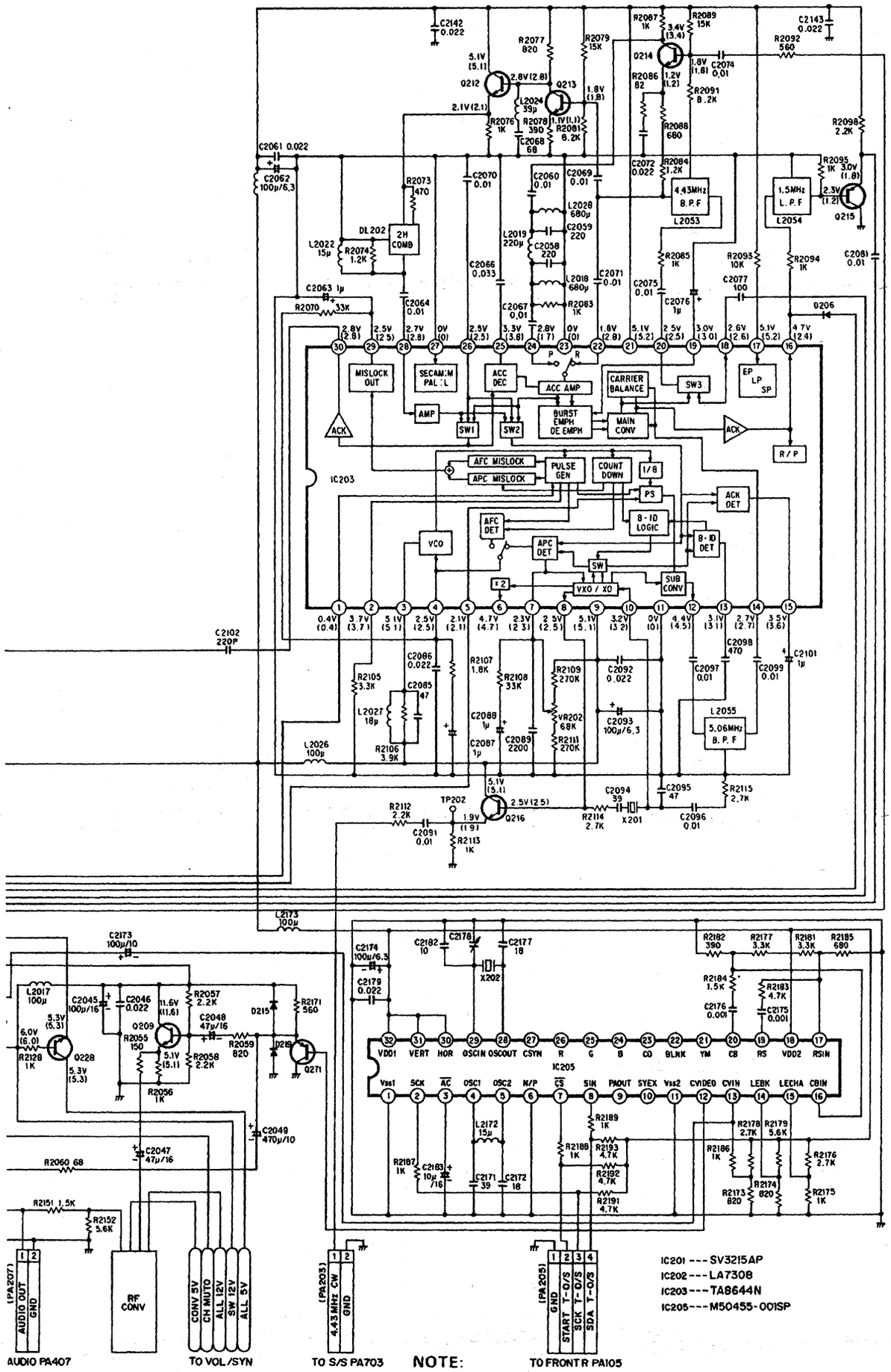
Schematic Location	Part No.	Description	Part No.	Description	Remarks
	0-4014-06075	FRONT RIGHT PC ASSY	0-4014-06076	FRONT RIGHT PC ASSY	Change
		(CAPACITOR)			
C1516	403 072 2703	CERAMIC 0.022U Z 50V	403 002 3602	CERAMIC 0.1U K 25V	Change
		(DIODES)			
D1512	407 012 4208	DIODE 1SS131			Delete
or	407 007 9904	DIODE GMA01			
		(IC)			
IC151	409 108 2204	IC LC6558D-3289	409 117 4206	IC LC6558D-3343	Change
		(RESISTOR)			
R1541	401 012 6903	CARBON 10K JA 1/4W			Delete

VIDEO CIRCUIT DIAGR



Q201 , Q202 , Q209 , Q212 ~ Q214 , Q216, Q222 ---------- 2SC536 (F,G)(NP,SP)
Q203 ---------- 2SC2999 (E)(SP)
Q205 ~ Q207, Q223, Q224, Q226, Q241 ---------- 2SC3400 or DTC124S
Q215 , Q221 , Q227 , Q235, Q271 ---------- 2SA608 (F,G)(NP,SP)
Q225 ---------- 2SC2274 (F)
Q228 ---------- 2SD400 (E,F)
Q204 ---------- 2SC536 (F)(NP,SP)
D201 , D203 , D204 , D209, D215, D219 ---------- 1SS133 or GMA01L
D216 ~ D218 , D220 or MA165 SA N
D202 ---------- MA165 SA N
D206 ---------- MA700

AM



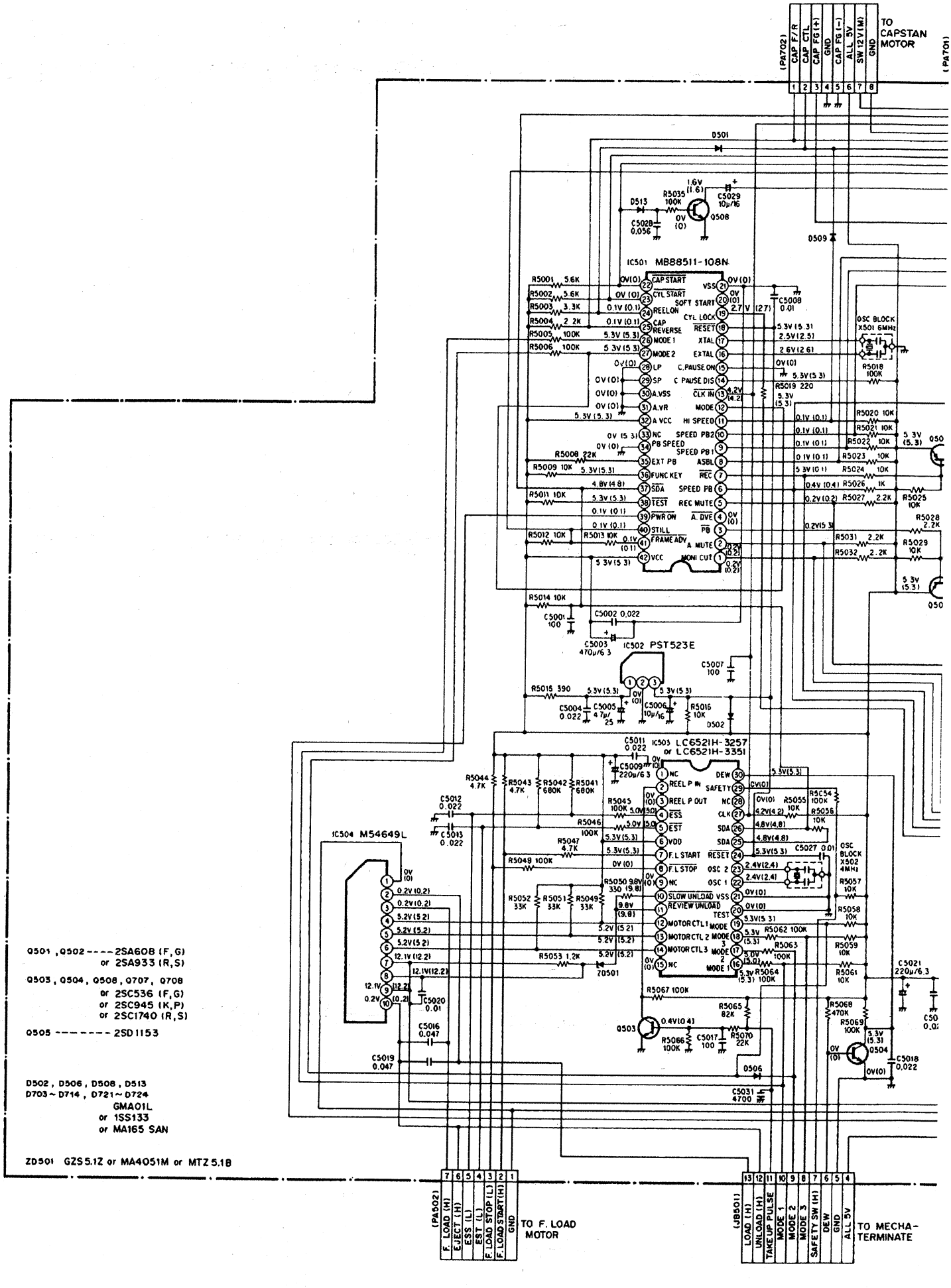
AUDIO PA407 TO VOL/SYN TO S/S PA703 TO FRONT R PA105

IC201 --- SV3215AP
IC202 --- LA7308
IC203 --- TA8644N
IC205 --- M50455-001SP

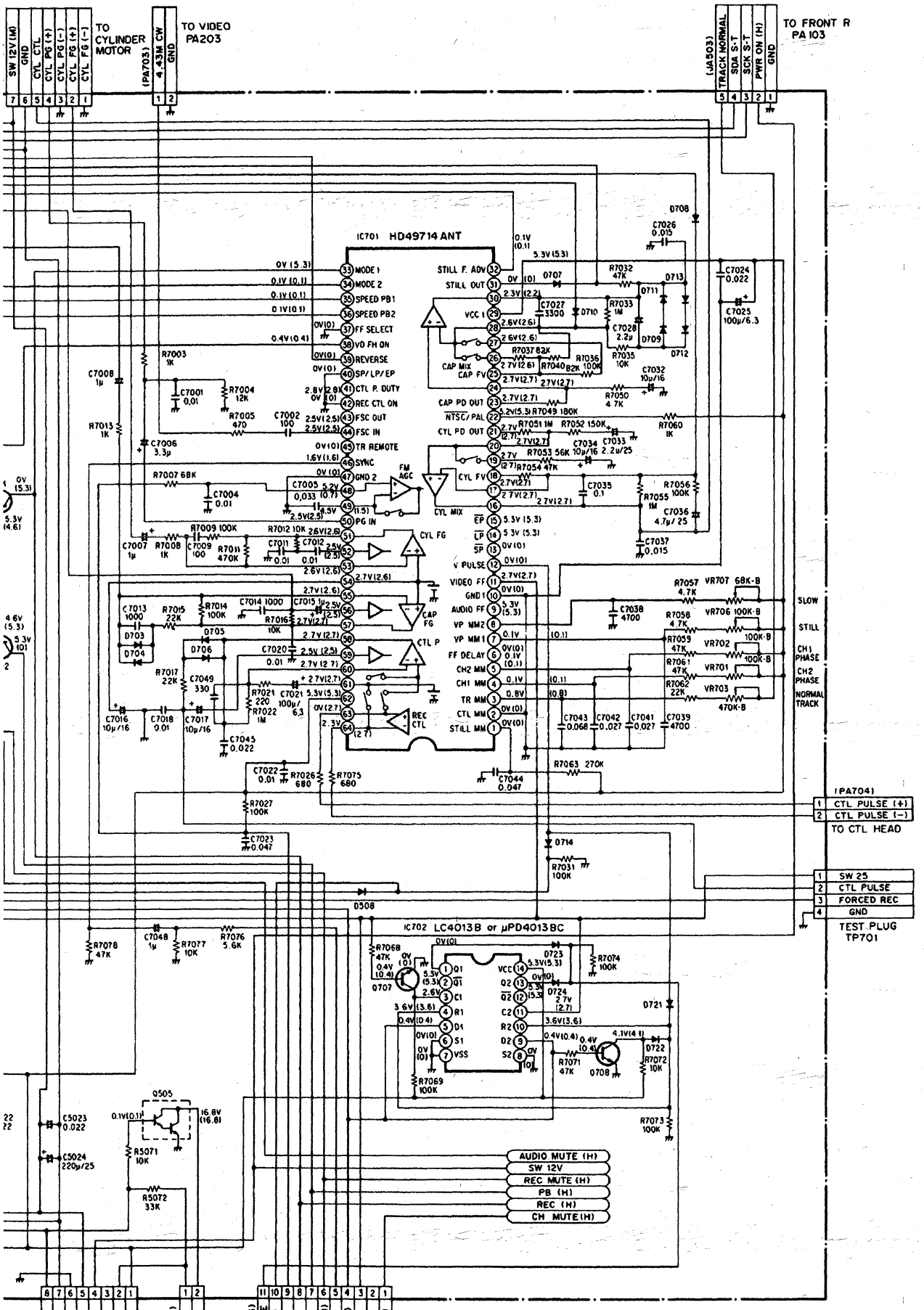
NOTE:

All voltage are measured in the PLAY and RECORD modes at SP unless otherwise noted.

( )=RECORD mode only.


(PA702)
CAP F/R
CAP CTL
CAP FG (+)
GND
CAP FG (−)
ALL 5V
SW 12V (M)
GND
TO CAPSTAN MOTOR
(PA701)
D501
D513
R5035 100K
C5029 10μ/16
C5028 0.056
Q508
Q509
IC501 MB88511-108N
CAP START
CYL START
REELON
CAP REVERSE
MODE 1
MODE 2
LP
SP
A.VSS
A.VR
A VCC
NC
PB SPEED
EXT PB
FUNC KEY
SDA
TEST
PWR ON
STILL
FRAME ADV
VCC
VSS
SOFT START
CYL LOCK
RESET
XTAL
EXTAL
C.PAUSE ON
C PAUSE DIS
CLK IN
MODE
HI SPEED
SPEED PB2
SPEED PB1
ASBL
REC
SPEED PB
REC MUTE
A. DVE
PB
A MUTE
MONI CUT
R5001 5.6K
R5002 5.6K
R5003 3.3K
R5004 2.2K
R5005 100K
R5006 100K
R5008 22K
R5009 10K
R5011 10K
R5012 10K
R5013 10K
R5014 10K
C5001 100
C5002 0.022
C5003 470μ/6.3
C5008 0.01
R5018 100K
OSC BLOCK X501 6MHz
R5019 220
R5020 10K
R5021 10K
R5022 10K
R5023 10K
R5024 10K
R5026 1K
R5027 2.2K
R5025 10K
R5028 2.2K
R5029 10K
R5031 2.2K
R5032 2.2K
IC502 PST523E
C5007 100
R5015 390
C5004 0.022
C5005 4.7μ/25
C5006 10μ/16
R5016 10K
D502
C5011 0.022
IC503 LC6521H-3257 or LC6521H-3351
C5009 220μ/6.3
R5044 4.7K
R5043 4.7K
R5042 680K
R5041 680K
C5012 0.022
C5013 0.022
R5045 100K
R5046 100K
R5047 4.7K
R5048 100K
R5049 33K
R5050 330
R5051 33K
R5052 33K
R5053 1.2K
ZD501
R5054 100K
R5055 10K
R5056 10K
C5027 0.01
OSC BLOCK X502 4MHz
R5057 10K
R5058 10K
R5059 10K
R5061 10K
R5062 100K
R5063 100K
R5064 100K
C5021 220μ/6.3
R5067 100K
R5065 82K
R5066 100K
C5017 100
R5070 22K
R5068 470K
R5069 100K
C5018 0.022
C5031 4700
IC504 M54649L
C5020 0.01
C5016 0.047
C5019 0.047
Q501 , Q502 ---- 2SA608 (F, G)
or 2SA933 (R, S)
Q503 , Q504 , Q508 , Q707 , Q708
or 2SC536 (F, G)
or 2SC945 (K, P)
or 2SC1740 (R, S)
Q505 -------- 2SD1153
D502 , D506 , D508 , D513
D703 ~ D714 , D721 ~ D724
GMA01L
or 1SS133
or MA165 SAN
ZD501 GZS5.1Z or MA4051M or MTZ5.1B
(PA502)
F. LOAD (H)
EJECT (H)
ESS (L)
EST (L)
F. LOAD STOP (L)
F. LOAD START (H)
GND
TO F. LOAD MOTOR
(JB501)
LOAD (H)
UNLOAD (H)
TAKE UP PULSE
MODE 1
MODE 2
MODE 3
SAFETY SW (H)
DEW
GND
ALL 5V
TO MECHA-TERMINATE

)L SERVO CIRCUIT DIAGRAM



NOTE:

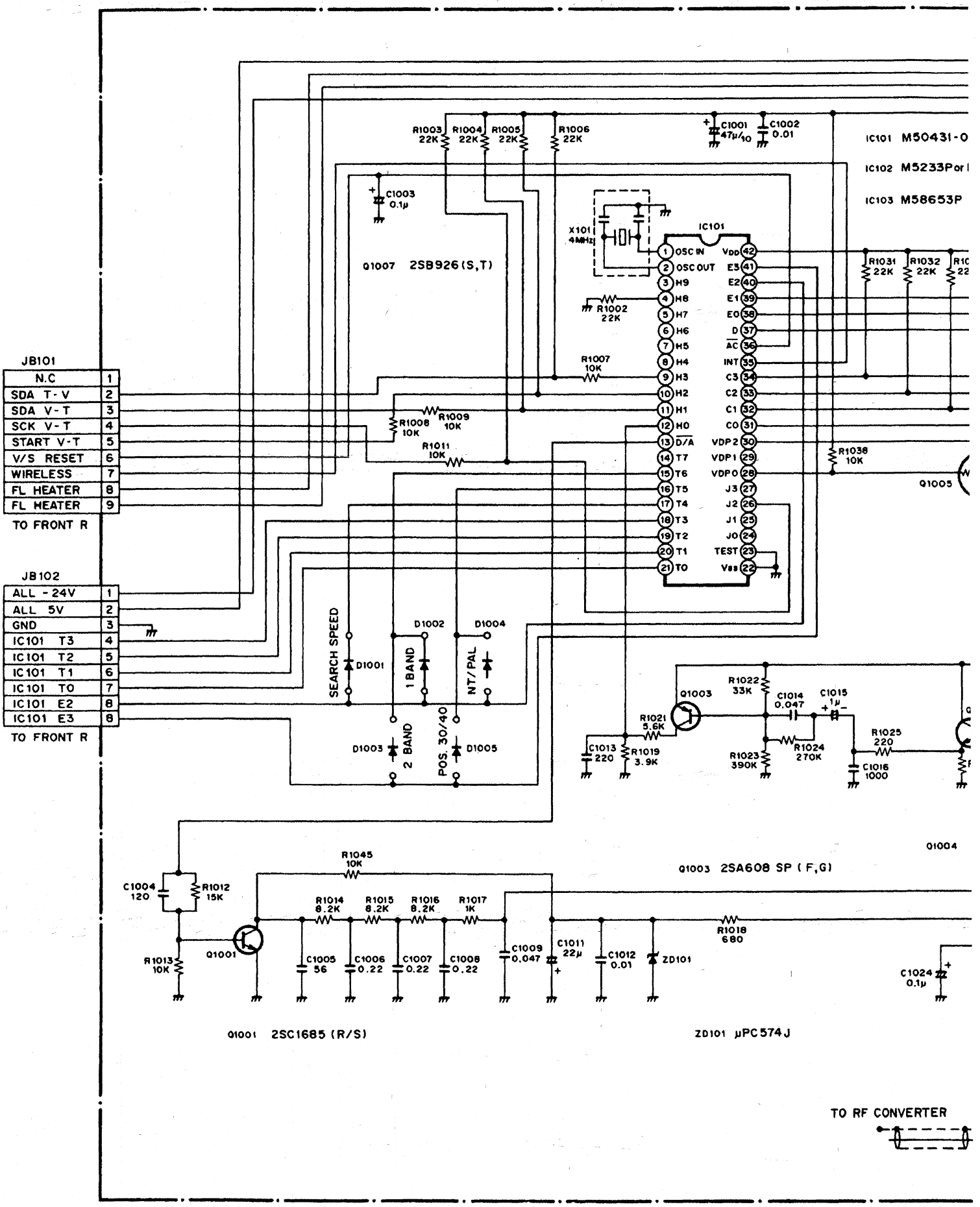
All voltage are measured in the PLAY, RECORD and STOP modes at SP unless otherwise noted.

(R)=RECORD mode only.

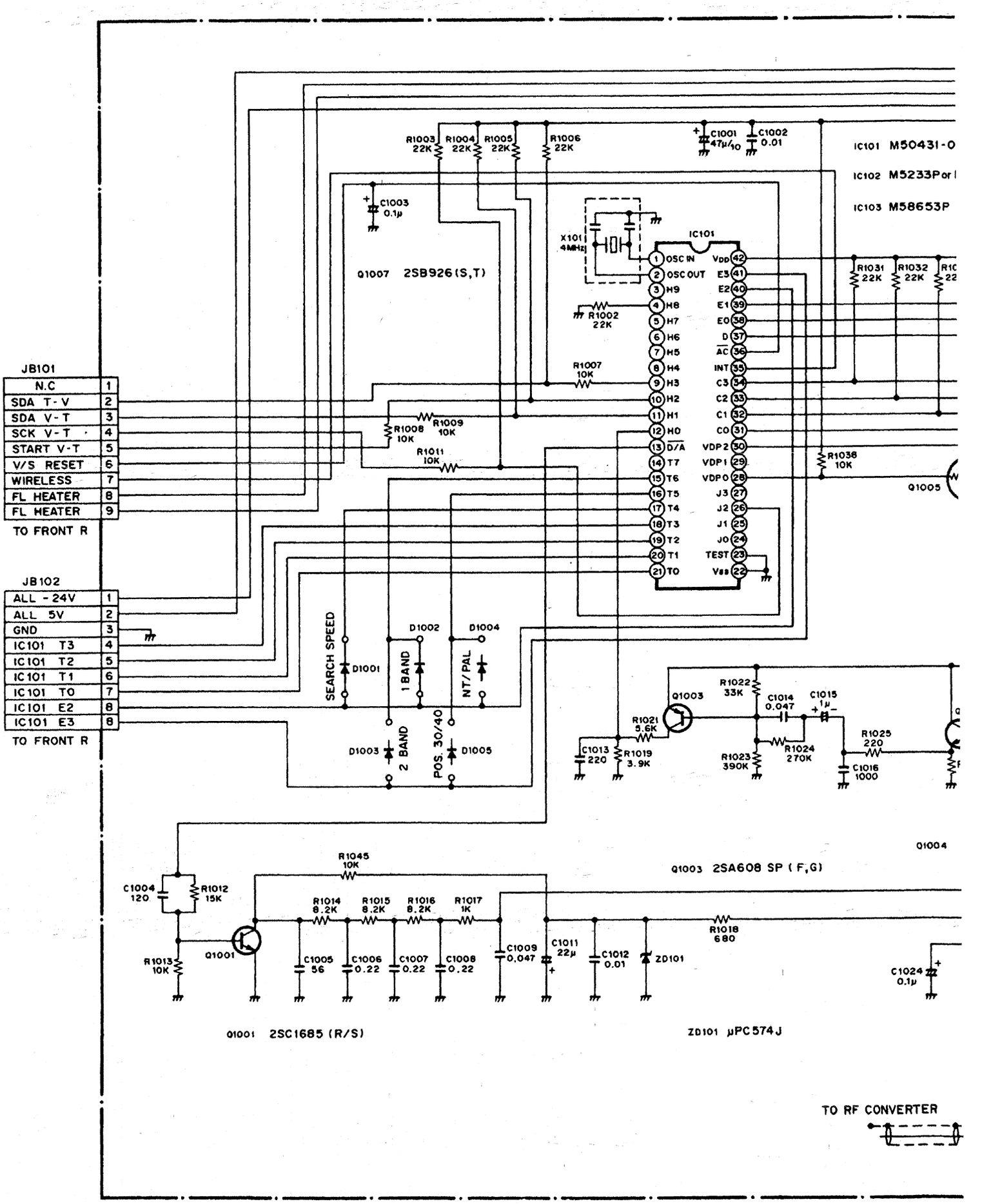
(S)=STOP mode only.

(P)=PLAY mode only.

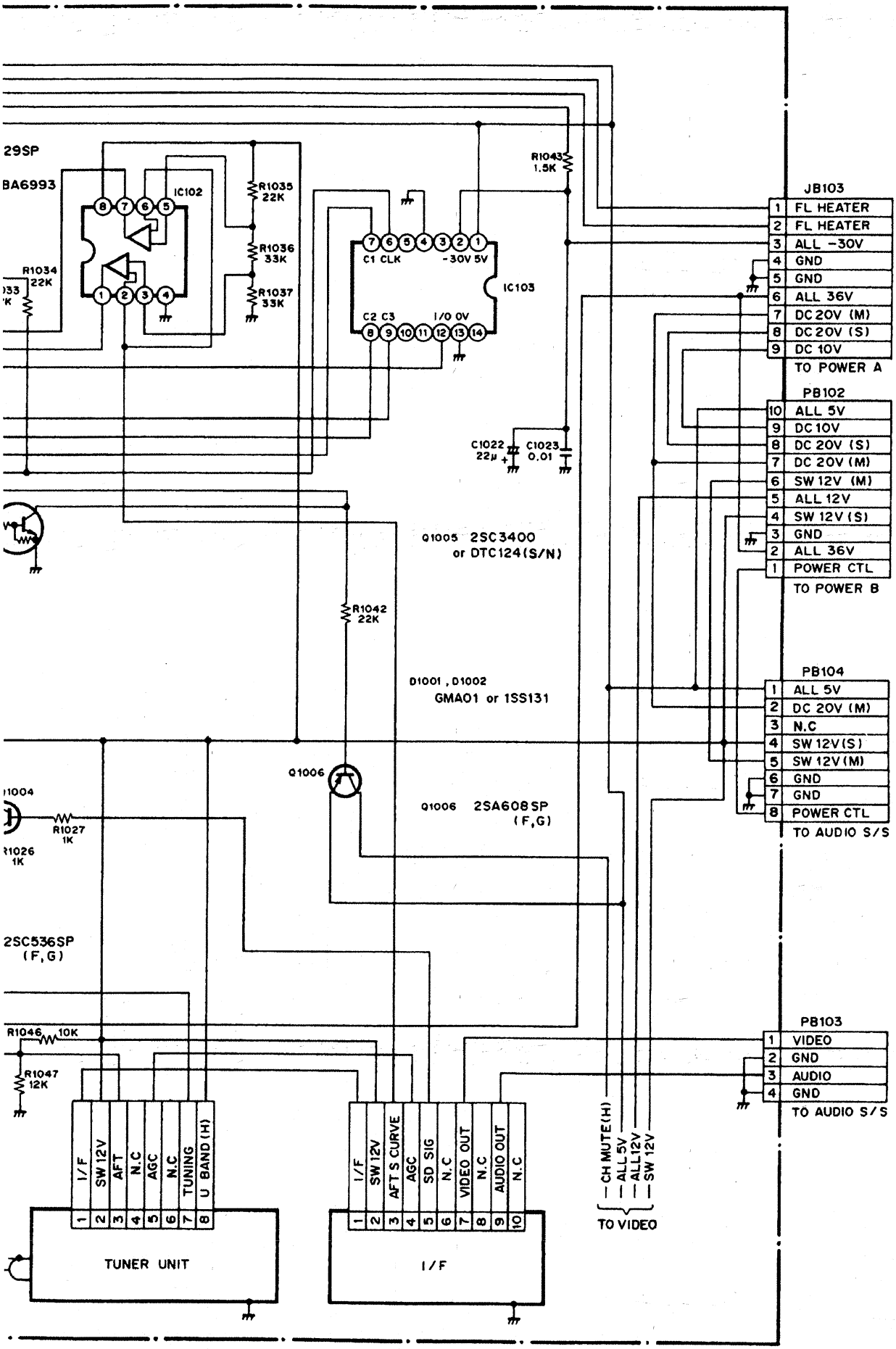
TUNER IF/VOLTAGE SYNTHESIZER CIRCUIT

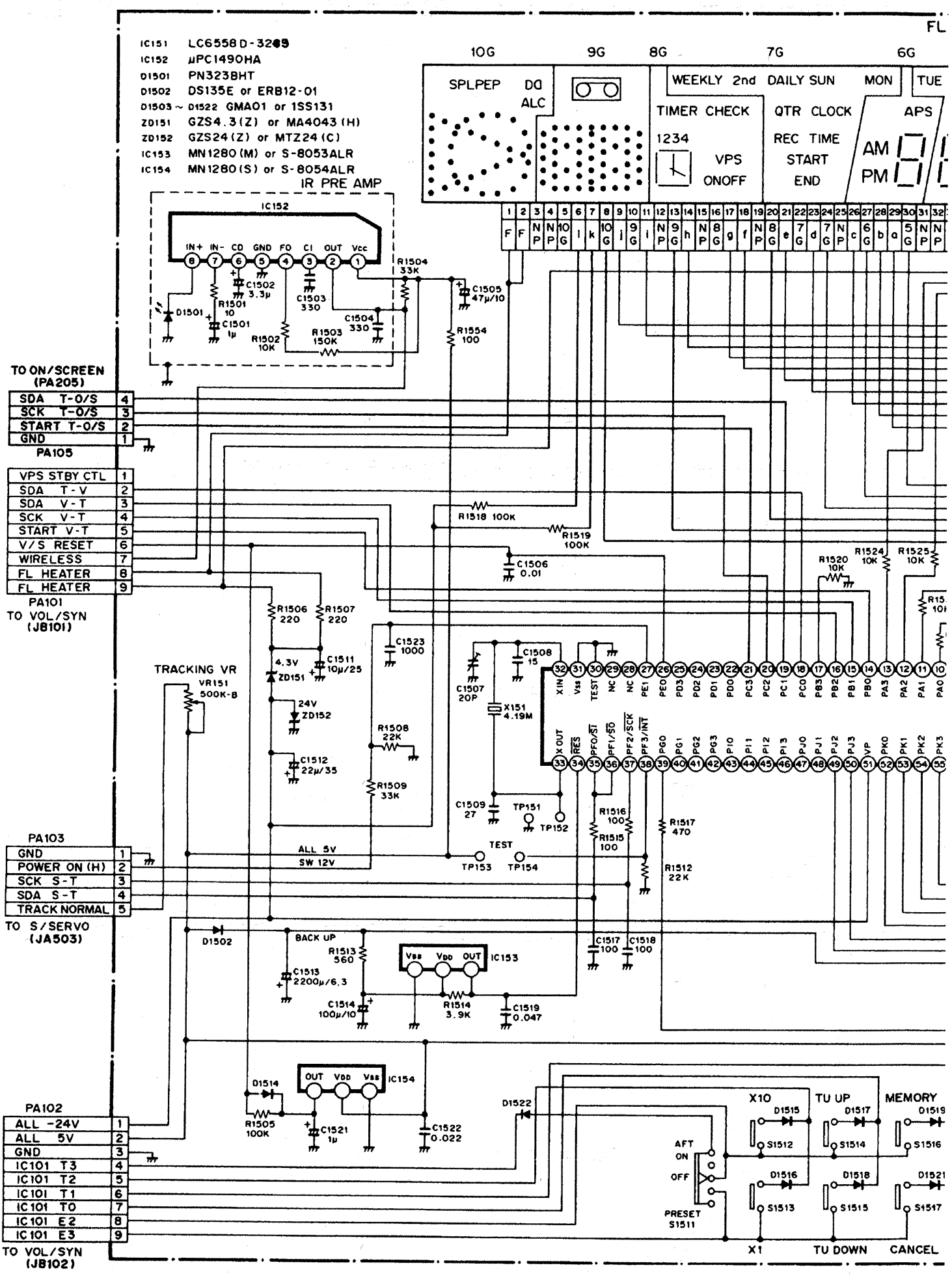


TUNER IF/VOLTAGE SYNTHESIZER CIRCUIT

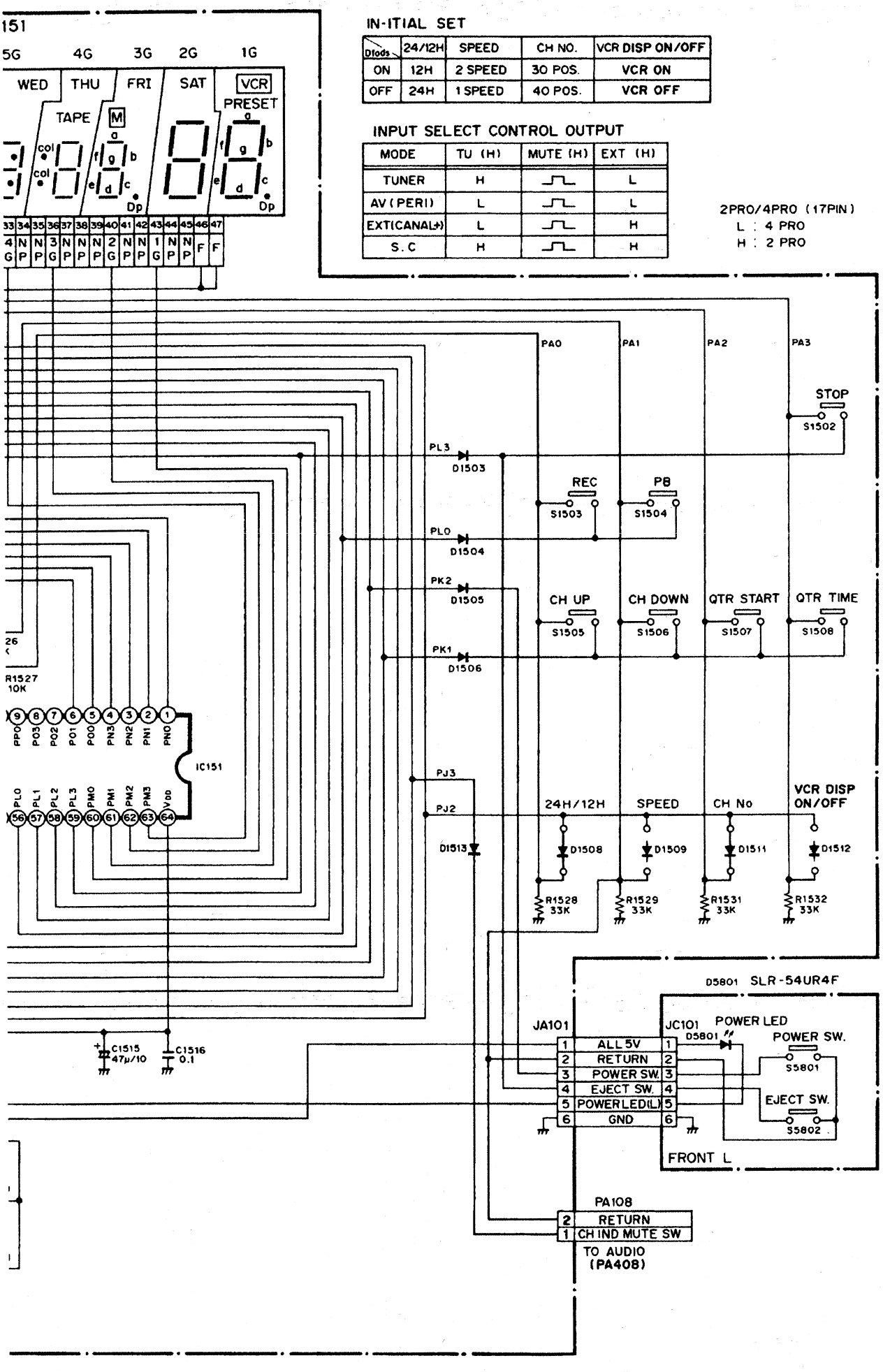


DIAGRAM


29SP
BA6993
IC102
R1035 22K
R1036 33K
R1037 33K
R1034 22K
R1043 1.5K
IC103
C1 CLK
-30V 5V
C2 C3
I/O 0V
C1022 22μ
C1023 0.01
Q1005 2SC3400
or DTC124(S/N)
R1042 22K
D1001 , D1002
GMA01 or 1SS131
Q1006
Q1006 2SA608SP
(F,G)
R1027 1K
1K
2SC536SP
(F,G)
R1046 10K
R1047 12K
JB103
1 FL HEATER
2 FL HEATER
3 ALL -30V
4 GND
5 GND
6 ALL 36V
7 DC 20V (M)
8 DC 20V (S)
9 DC 10V
TO POWER A
PB102
10 ALL 5V
9 DC 10V
8 DC 20V (S)
7 DC 20V (M)
6 SW 12V (M)
5 ALL 12V
4 SW 12V (S)
3 GND
2 ALL 36V
1 POWER CTL
TO POWER B
PB104
1 ALL 5V
2 DC 20V (M)
3 N.C
4 SW 12V(S)
5 SW 12V(M)
6 GND
7 GND
8 POWER CTL
TO AUDIO S/S
PB103
1 VIDEO
2 GND
3 AUDIO
4 GND
TO AUDIO S/S
1 I/F
2 SW 12V
3 AFT
4 N.C
5 AGC
6 N.C
7 TUNING
8 U BAND (H)
TUNER UNIT
1 I/F
2 SW 12V
3 AFT S CURVE
4 AGC
5 SD SIG
6 N.C
7 VIDEO OUT
8 N.C
9 AUDIO OUT
10 N.C
I/F
CH MUTE(H)
ALL 5V
ALL 12V
SW 12V
TO VIDEO


IC151 LC6558D-3265
IC152 μPC1490HA
D1501 PN323BHT
D1502 DS135E or ERB12-01
D1503 ~ D1522 GMA01 or 1SS131
ZD151 GZS4.3(Z) or MA4043(H)
ZD152 GZS24(Z) or MTZ24(C)
IC153 MN1280(M) or S-8053ALR
IC154 MN1280(S) or S-8054ALR
IR PRE AMP
IC152
IN+ IN- CD GND FO CI OUT Vcc
R1504 33K
C1505 47μ/10
C1502 3.3μ
R1501 10
C1501 1μ
D1501
C1503 330
C1504 330
R1502 10K
R1503 150K
R1554 100
10G 9G 8G 7G 6G
SPLPEP DG ALC
WEEKLY 2nd DAILY SUN MON TUE
TIMER CHECK
1234
VPS ONOFF
QTR CLOCK
REC TIME START END
APS
AM PM
TO ON/SCREEN (PA205)
SDA T-O/S 4
SCK T-O/S 3
START T-O/S 2
GND 1
PA105
VPS STBY CTL 1
SDA T-V 2
SDA V-T 3
SCK V-T 4
START V-T 5
V/S RESET 6
WIRELESS 7
FL HEATER 8
FL HEATER 9
PA101
TO VOL/SYN (JB101)
R1518 100K
R1519 100K
C1506 0.01
R1520 10K
R1524 10K
R1525 10K
R1506 220
R1507 220
C1523 1000
4.3V ZD151
C1511 10μ/25
24V ZD152
C1512 22μ/35
R1508 22K
R1509 33K
TRACKING VR
VR151 500K-B
C1507 20P
C1508 15
X151 4.19M
C1509 27
TP151
TP152
TP153
TP154
TEST
R1516 100
R1515 100
R1517 470
R1512 22K
PA103
GND 1
POWER ON (H) 2
SCK S-T 3
SDA S-T 4
TRACK NORMAL 5
TO S/SERVO (JA503)
ALL 5V
SW 12V
D1502
BACK UP
R1513 560
C1513 2200μ/6.3
C1514 100μ/10
R1514 3.9K
C1519 0.047
C1517 100
C1518 100
D1514
R1505 100K
C1521 1μ
C1522 0.022
D1522
PA102
ALL -24V 1
ALL 5V 2
GND 3
IC101 T3 4
IC101 T2 5
IC101 T1 6
IC101 T0 7
IC101 E2 8
IC101 E3 9
TO VOL/SYN (JB102)
X10
TU UP
MEMORY
D1515
D1517
D1519
S1512
S1514
S1516
D1516
D1518
D1521
S1513
S1515
S1517
AFT ON OFF
PRESET S1511
X1
TU DOWN
CANCEL

T CIRCUIT DIAGRAM



IN-ITIAL SET				
Dfods	24/12H	SPEED	CH NO.	VCR DISP ON/OFF
ON	12H	2 SPEED	30 POS.	VCR ON
OFF	24H	1 SPEED	40 POS.	VCR OFF

INPUT SELECT CONTROL OUTPUT			
MODE	TU (H)	MUTE (H)	EXT (H)
TUNER	H	⎍⎍	L
AV (PERI)	L	⎍⎍	L
EXT(CANAL+)	L	⎍⎍	H
S.C	H	⎍⎍	H